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Stop Short. Deliberately limit your own talking. Practice the art of listening.

Hold Your Tongue. Don’t interrupt. Often their pause is a sign that they are thinking and need additional time to formulate what they want to say next.

What Did They Say? Ask questions that help confirm what you think you heard. Repeat their answer as you understood so that they can rephrase it if necessary.

Open Your Mind. React to ideas ... not the person.

Take Your Time. Don’t jump to an early conclusion. Ask if their thoughts are fully “out on the table” for your consideration.

Practice right from this very moment listening to those around you. They have much to say—some valuable ideas are waiting to be heard for you can use your arborist touch to grow and develop them into a daily practice. Make it a habit to listen—to your employees, your wife or husband, your children—even your grandparents ... It will pay dividends for many years to come.

Chris Brown
Director of Communications

p.s. The NAA knows you enjoy reading TCI, because we hear from you—every day. And now it’s time to hand the OUTLOOK writer’s pen to Barry Cullen, the NAA’s new executive director. Please welcome Barry.

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Planning to Save Trees Before and During Construction

By Robert Rouse

Tree care companies act as consultants for developers, landscape architects and town boards to save trees from tree-destroying construction practices.

When Turf Meets Trees

By Sunita Khosla

What arborists should know about the role of turf fertilizers in tree and turf competition.

Technology and the Arborist

By Sachin Mohan

A review of the most recent technological advances in decay detection.

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Regular inspections during construction ensure that the preservation plan is being implemented properly.

Planning to Save Trees
Before and During Construction

By Robert Rouse

All arborists know this drill. Mr. and Mrs. Smith call with concerns about their once beautiful trees. When they bought their new house three years ago, all the trees in their yard, and in the whole neighborhood for that matter, looked healthy. They even chose their house over another because the large oak in the front yard reminded Mr. Smith of the stately tree that adorned the front yard of his boyhood home.

A few of the smaller trees died soon after they moved in, but that didn’t concern them. Last year they noticed a few limbs on the large oak had died. The shade cast by the once graceful tree seemed a bit sparse. Many of the small branches dropped over the summer. When the Jones’ large horsechestnut died, they became more concerned. The Smiths noticed that other trees in the neighborhood also appeared unhealthy. They decided to call a professional, but as winter approached they became busy with holiday plans, the call was forgotten.

This spring their beloved oak produced very sparse foliage. Many limbs did not produce any leaves at all and appeared dead. Some new shoots seemed to be growing near the trunk. The Smiths’ knew professional help was needed. They called you immediately, asking the inevitable question ... “Can you save my tree?”

You ask the usual questions and get the usual answers: Yes, the house was constructed nearly three years ago. Yes, the grade was changed, but the builder said it wasn’t enough to hurt the trees. No, I don’t recall our trees having a root flare, actually the trunk appears to be mostly straight at the base.

As you drive to the Smith residence, you ponder how to break the bad news. You hope there might be some other trees on the property that are not beyond salvation. If only you had been consulted sooner. Or better yet, what if you had been called to give advice before the house was even built. What if you had been called when the land was still a wooded lot!

Most arborists are consulted when it’s much too late to save a tree. All too often an arborist is forced to make an “after-the-fact” assessment based on the untrained observations of the client and what information can be gathered from the site. Arborists must decide to what extent the soil was compacted, what part of the original grade was altered and how those factors are affecting the tree.

Remedial actions such as aeration, irrigation, fertilizing and addition of natural organic, microbial and mycorrhizal soil inoculations are often recommended. Sometimes radial trenching, soil fracturing or even returning to the original grade is helpful. If it’s not too late, and the damage to the original root system not too severe, these procedures can be effective.

However, nothing can save a tree like carefully planned and effectively implemented protection during construction. As our urban and suburban tree canopy shrinks, many municipalities are finally starting to recognize just how valuable trees are. These cities, towns and counties have implemented and enforced ordinances that not only protect trees on existing property, but also require that protective measures be taken before and during construction.

Increasingly, arborists are called upon to advise developers, and even write tree impact statements. The most important questions addressed are: Which trees should be preserved, and how should we preserve them? In this fashion, the arborist has an integral role in the planning of the development.

The role of the arborist doesn’t end there. Construction contractors are advised on how to obey the tree preservation plan during development. Routine inspections during development may even result in penalties being levied for violations. Yes, penalties! If only you could levy a fine on careless contractors.

Tree impact statements and preconstruction plans

A company at the forefront of providing tree preservation planning is Corporate Commercial Services, Inc., located in San Jose, Calif. A full-service tree care provider, the company specializes but is not limited to the maintenance of commercial
This oak survived substantial root loss because of careful preconstruction planning.

Many arborists have been frustrated when dealing with landscape architects. There has been a historical lack of understanding between the two groups. While more and more architects view arborists as part of the “inside” planning team, many still regard arborists as necessary only for gathering information and making some recommendations.

“It's really surprising that there is still not a connection with the landscape architects,” Friedmann notes. “While they have become more educated over the years, there isn’t the cohesiveness that certainly should be there.”

Case study: Rewrite the rules with planning and expertise

One project of which Friedmann is particularly proud is a residential development in Saratoga, California. This town has some of the most pro-tree ordinances in California, making Saratoga one of the most pro-tree towns in a state that is home to some of the most pro-tree towns and cities in the whole United States. In Saratoga, any tree greater than 8 inches in diameter is protected by the town ordinances!

Chain-link fences are effective barriers to both construction equipment and workers.
A developer wanted to build one single family home on a 1.5 acre property. Three mature coast live oaks, *Quercus agrifolia*, were located in the middle of the property. According to town ordinances, the developer’s only choice was to build a long, skinny home with a narrow frontage to avoid encroaching upon the drip-line of the trees.

Corporate and Commercial Services was called to assess the situation. They analyzed the soil tests, topography maps, grading plans, etc. They determined that the soil’s structure, which was not the typical red clay of the area, would limit the tree’s water management efficiency. Trees that are in a moist soil, with minimal root zone damage, are a lower priority for inoculation. “We have found that trees in a dry environment have benefitted most from mycorrhizae,” relates Milton.

Northeast Shade Tree of Portsmouth, N.H., is a company that specializes in soil treatments. Jeff Ott, Northeast’s president, recommends a pre-treatment as the “most effective approach.”

He was recently involved in a tree preservation project where mycorrhizal inoculations were used. The famous retail company, L.L.Bean, needed to expand its parking lot while preserving as many trees as possible. Northeast Shade Tree was called in fall ’95, after the project was planned. According to Ott, “some changes to the plan were made to expand the root zones. It was too late in the fall to do any treatments, so we weren’t able to do treatments until the following spring when construction was already in progress.”

One specific tree, a large white ash, *Fraxinus americana*, had 50 percent of its root system removed. Ott devised a treatment plan that included beneficial bacteria and mycorrhizal inoculations. The tree responded so well he was concerned it had produced too much leaf surface area the first year. Today, the tree is healthy and provides a welcome island of green in its new hard-scape environment. Overall, 40 trees were treated with mycorrhizal inoculations. So far, all are surviving.

The tree protection zone was carefully prescribed. A chain-link protection zone fence was installed. At one point it was run very close to the trunk of the tree to allow for the new house, while on the other side of the trees it protected ample portions of the root zone. Chain-link fences are always used by Corporate and Commercial Services to secure the tree preservation zone, because they have found that the standard plastic snow fencing usually falls long before the project is complete.

Today, the success of the project is evident. The trees are healthier than at the start as a result of the attention they received, despite the loss of a large portion of their foliage.
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Rainbow Treecare before: This oak was prepared for construction well before the groundbreaking on a new development.

Rainbow Treecare during: Construction workers always bring work activity right up to the tree protection fence.

Rainbow Treecare after: The oak survived, becoming a focal point for the development’s model home.

Impact statements and preconstruction plans

SavATree is a growing company headquartered in Bedford Hills, N.Y. Their business is primarily based on providing holistic tree therapy programs utilizing various natural and organic products. Although a small portion of their business, SavATree does provide consulting services to developers if there is a chance they will also be providing the actual services.

Many municipalities in the northeast are becoming more aware of the value of trees. As a result, developers get the message too. According to SavATree’s President, Daniel Van Starrenburg, “Developers who have mandates regarding trees in their agreements with local governments tend to be extremely motivated and receptive to our recommendations. Some of the towns around here have gotten so sophisticated that they have a penalty applied for each tree that dies within ‘x’ number of years of completion of the project.”

Developers under a town mandate are not the only clients interested in preserving trees before construction. Van Starrenburg finds custom builders are a very receptive audience. When the client of an expensive home expresses particular concerns about trees in the landscape, the developer will seek an expert opinion to be sure the proper precautions are taken.

Custom builders with concerned clients are most likely to employ extraordinary measures to preserve a tree. SavATree has recommended the installation of canopy mist irrigation systems to avoid water stress in trees that would be particularly sensitive. On another occasion SavATree recommended the builder use a “bridge” in the foundation to avoid severing some important tree roots.

Case Study:
One tree in the spotlight

Many towns do not have ordinances that require careful planning of new construction to preserve trees. The typical tree care company is limited to protecting trees from construction damage on a case-by-case basis. Nevertheless, many of these smaller scale tree preservation projects are no less impressive.
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Michael Hutnick, Tree Care Inc.

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Willie Carroll (l) and Michael Hutnick (r), owners of Tree Care Incorporated. They are happy with the KEY KNIFE systems they have installed in their equipment.

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Rainbow Treecare of St. Louis Park, Minn., typically does not get involved in large scale projects, writing impact statements, or elaborate preservation plans for whole developments. “We offer preconstruction meetings with individual homeowners,” says Jim Walsh, Rainbow’s general manager. “We advise them on how to minimize the damage to the tree and also what types of things you might do to encourage good tree health before and after construction.”

In these types of tree protection cases, Walsh points out, “what we are really looking for is a good candidate, and trying to help people know which trees are good candidates in which to make an investment. We are then able to develop a long-term relationship with that customer.”

Walsh admits that marketing this type of service is his biggest challenge. “Most people don’t think about their trees until they start to look poorly.”

Walsh offers a description of one tree protection project that utilized elaborate techniques. The owner of a house planned to build an addition that would double the size of the foundation. The excavation would result in the loss of a large amount of a tree’s root system. The owners were very concerned with the long-term prospects for the tree.

In this case, nothing could prevent extensive damage to the root system, however, the amount of compaction caused by construction equipment could be minimized. Under the advice of Rainbow Treecare, a contractor was found to dig the foundation by hand. The roots were carefully cut as the trench was slowly excavated. This greatly reduced the need for heavy excavation equipment. Eight years later, the tree looks spectacular, despite the loss of a large portion of the root system.

Al Olsen, vice president of Rainbow Treecare, has consulted on a number of preconstruction tree preservation projects. He notes that towns in the area have become more sophisticated with their tree protection ordinances. On one project in a suburb of Minneapolis, a nationally known developer placed Olsen on retainer as project forester. He was consulted whenever an important tree would be affected by construction activities. According to Olsen, “The city was giving us variances right and left to save significant trees.”

The developer eventually used the preserved trees as an important selling point for the properties. They were even featured prominently in the developer’s brochures.

Another project on which Olsen collaborated was the preservation of a tree for a development’s model home. The area was pastureland, so trees were few and far between. This made the prominent oak even more special.

The preconstruction care for the tree included repairing an old storm injury that had been neglected. Olsen stresses the importance of maintaining the tree preservation zone. “Inevitably the con-

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struction activity will proceed right to the fence.”

Olsen also made regular inspections, since “the fence had to be repeatedly staked to prevent the construction from spilling over into the root zone.” The tree survived with flying colors and is one of the important focal points of the development. It is even lit by spotlights at night.

Techniques to remember

Techniques used to preserve trees before and during construction will vary for the needs of each development. Many factors must be considered: soil type, drainage patterns and the species of trees are of universal concern.

Arborguard Tree Specialists of Avondale Estates, Ga., provides comprehensive tree protection for both residential and commercial construction. Like Corporate and Commercial Services, Arborguard is a full-service company, providing both consulting and preservation services.

Jesse Milton, Arborguard’s technical advisor points out since development in Atlanta is often cutting into forest land, “we find that two of the biggest stresses on trees are changed drainage patterns and increased sunlight to trees that were usually buffered by the surrounding trees.”

“The key techniques that we utilize are mulching, to keep soil cool, and implementing irrigation programs,” relates Milton. He warns, however, that “When you are making soil cuts, you change the drainage patterns of water that’s below and above the surface. Without a water management plan, you probably cut your survival chances in half.”

In a common tree preservation project, inventories and tree health assessments of the site trees are taken. Initial consultations determine what trees are suitable for preservation and what techniques should be utilized. After it has been determined that the tree is a good candidate for preservation, the steps prescribed in the preservation plan are often similar.

1. Get the trees in optimum vigor. This is done by starting with a soil sample and applying micro, secondary and primary nutrients based on the analysis. Bio-stimulants and mycorrhizal soil inoculations are often used to further stimulate the root system.

2. Design a monitoring program. This is the best way to ensure regular observation of the health of the trees during the construction process. Insect and disease problems can then be dealt with effectively as they appear. Monitoring inspections also ensure that the subcontractors are complying with the preservation plan. To be effective, monitoring inspections must be performed frequently.

3. Consider the moisture requirements of the tree. This may be the most important step of all, since root damage reduces the trees’ absorbing capacity. Davey Tree Expert Company of Kent, Ohio, recently went so far as to bury
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crop-moisture monitors around a tree being preserved by the Maryland Department of Transportation. The monitors were regularly checked and the trees irrigated based on the readings. Often, the arborist must provide the means of irrigation too. For most situations, drip irrigation—which is easily installed, monitored and adjusted to provide adequate soil moisture—is the favored method.

4. **Preserve the root zone.** Restrict construction activity near the root zone by erecting plastic or wood fencing. Chain-link fences are an even better alternative. Root zone fencing usually is placed at the drip-line or farther out if possible. Scientists and arborists recognize that the root zone often extends well beyond the drip-line of a tree's canopy. According to Dr. Donald Marx of Plant Health Care, Inc., “the roots of a tree may extend up to three times the reach of the canopy.” Mulching can be used inside the tree preservation zone to both conserve soil moisture and to limit compaction of pedestrian traffic.

5. **Prune carefully.** When construction of a new subdivision is underway, the developer is often taking trees that were in a forest environment and never maintained. They probably contain a lot of deadwood and poorly formed branch crotches. When construction ends, the trees will be exposed to climbing children and backyard

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**To Learn More ...**

For those interested in learning the latest techniques for preserving trees from construction damage, or what remedial methods will give construction-damaged trees a fighting chance for survival, a number of resources are available.

Nelda Matheny and Dr. Jim Clark, principals of Hortscience, Inc., a California-based tree and urban forestry consulting firm, have a new book out soon that outlines how to provide therapy for construction-damaged trees. Matheny will also be presenting a seminar on the subject during TCI EXPO '97 in Columbus, Ohio. Their first book, *Trees and Development*, was an overview of the techniques necessary to successfully protect trees before and during construction.

Matheny and Clark's book is full of useful facts and practical applications. For instance, they provide tree preservation zone guidelines based on the species tolerance to disturbance and tree age. They convincingly argue that this method is more accurate, and flexible, than using the drip-line or trying to extrapolate a root zone from the tree’s height.

To stop mulch from being continuously compressed into the soil as construction equipment drives over it, Matheny recommends putting a geo-textile under it. “Either that, or keep replenishing the mulch. The geo-textile helps distribute the weight as well.”

If you want to limit the size and depth of a road bed, perhaps to design a less-intrusive driveway while minimally damaging roots, Matheny recommends using extra reinforcement in paving materials, which makes the pavement surface stronger, so you don’t have to rely on what’s under it to support it.

Aeration devices underneath roadways are often recommended to provide tree roots with oxygen. Matheny cautions, however, that “there is no information saying it does any good. People continue to do it hoping that it helps, but we don’t know if it does or not.” In addition, she says with a chuckle, “engineers are generally unimpressed with those aeration systems because of the potential for instability. If it’s a load-bearing structure, it probably would not be approved.”

If Matheny's workshop at TCI EXPO is not enough, The National Arbor Day Foundation, together with the National Association of Home Builders, is sponsoring three workshops, titled *Building with Trees*, this September. The workshops teach progressive tree preservation techniques, such as how to make a site map, identify a root zone, and how best to protect that zone. Contact the National Arbor Day Foundation at 402-474-5655 for more information or to register.
Cookouts. Remedial pruning is often necessary to make these trees safe.

Other steps, usually taken before construction commences, may include structural enhancements, such as installation of rigid or cable braces, and even lightning protection systems.

**Construction monitoring**

Protection plans are only as good as how forcefully they are implemented. “One thing that is often neglected after protection specifications are made is monitoring during construction,” warns Milton. “So many things can happen. We will often build inspections into the price of the consultation.”

From those consultations, Milton recommends arborists generate a report with copies for all parties involved with the preservation. He includes any findings of construction damage that has occurred between inspections, as well as a report on the general health of the trees.

Punitive fines can be an important part of the preservation plan, whether the municipality requires them or not. Arborguard gives the project owner the option of levying punitive fines for violations of the plan. Arborguard was involved in two notable projects that utilized punitive fines: A development at Georgia Tech in conjunction with the Olympic Games and the construction of a new headquarters for United Parcel Service. Fines in these projects were based on the Council of Tree and Landscape Appraisers guidelines.

Many companies also offer post-construction maintenance plans to future managers or residents of the completed development. The development’s new residents are usually not aware of the traumatic events that their beautiful trees just survived. Informing them about the effort and expense expended to preserve their trees will underscore the importance of continued tree care.

**Conclusion**

Arborists in the field estimate that when they are contacted by the architect, landscape architect or even the owner of the property beforehand, the success rate is about 400 percent better than getting called in afterward. Although this may seem obvious to arborists, there is still a commanding need for those in the profession to carry this message.

When asked how a local arborist can get involved in preserving trees from construction damage, Friedmann of Corporate and Commercial Services advises: “The first step has to be education. They have to educate themselves on the entire process, and, most importantly, what their role is in that process. Step two would be understanding the municipalities and the various organizations that would ultimately be approving these projects and establishing relationships with them. Step three would be to get the word out that this is a service they can provide. Make contacts, whether it be landscape architects, designers or the folks who do the construction.”

Robert Rouse is staff arborist with the National Arborist Association.
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Is Your Family Business Experiencing a Turnover?

Is your tree care business expecting its top executive to retire in the next five years? If so, your company joins 28 percent of other family-owned companies in the U.S., reports the 1997 Arthur Anderson/MassMutual American Family Business Survey. An additional 14 percent of chief executive officers plan to semi-retire within the same five year time period. Astonishingly, nearly a third of retiring executives over age 61 and almost two-fifths of retirees between age 56 and 60 have not yet named a successor. The few who have chosen someone to lead the next generation of the company generally selected a family member.

The widespread lack of planning, however, seems to be a trend. In the case of most family businesses, strategic planning issues such as estate and investment planning are not written down in formal documents. Most respondents plan to rely on life insurance policies to cover estate and death taxes, rather than making long-term investments.

According to the survey, 42 percent of respondents are considering co-CEOs to guide the company. Lara Beaudoin of MassMutual's Family Business Enterprise in Hartford, Conn., explains, "The owner can't decide which child to choose."

While co-CEO situations split the family business among siblings in what may seem a fair manner, conflicts and disagreements are bound to arise. For this reason, Arthur Anderson and MassMutual suggest adding impartial, nonfamily members to the decision-making board who will not favor one co-CEO over another.

Beaudoin notes a correlation between the increase in co-CEOs and the rise of women's role in family business. As more leadership positions are created, both genders will be required to fill them. Dr. Joe Astrachan at Kennesaw State University's Family Enterprise Center analyzed the survey results. He concludes that with the increase of daughters accepting a vital role in family businesses, "the pool of good management talent has doubled. For a number of reasons there have been changes in society. People are regarded and evaluated in an unbiased manner."

Currently, five percent of family businesses are led by women. However, 25 percent of surveyed companies believe the future CEO may be a woman. Unfortunately, only 5.4 percent of respondents were from service industries such as the Green Industry. Hopefully in the future more of these businesses will be asked to respond. Nevertheless, the challenges found in the study should apply to family-owned tree care companies: careful planning eases succession issues.
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When Turf Meets Trees

In the battle for nutrients, some turf fertilizer may reach tree roots. What should arborists know about the upper 12 inches of soil in the suburban landscape?

The lush, emerald fairway of a golf course illustrates how soft and comforting grass can be. It is for this grand effect—on golf courses and suburban lawns—that turf fertilizers are designed. Their high nitrogen content keeps chloroplasts busy with photosynthesis while each grass blade drinks up water from the soil.

Meticulous feeding, watering and care is necessary for golf courses where irons gouge divots and carts flatten paths. In the home landscape, however, this level of supervision may be harmful because grass and its fertilizer become part of a contrived ecosystem that affects trees and shrubs.

“What’s good for the turf is not necessarily good for the tree,” notes Claire Reinbergen, president of Growth Products, Inc. Reinbergen, who has had extensive experience with highly groomed turf settings, adds, “This is not a natural setting. Over the years, you will see decline.”

Turf vs. trees

A quick glance at the forest floor shows that turf and trees are not uniquely suited for one another. In the native forest, nutrient-rich leaf litter is king, not grass. Yet in the urban forest, property owners demand a home landscape ecosystem where turf is predominant. Understanding the different nutrient needs of turf and trees—and the interaction of turf fertilizers with a tree’s growth processes—is absolutely necessary for an arborist to promote healthy tree growth.

Turf roots share the same ecological niche in the soil as a tree’s feeder roots, and subsequently compete for the same water and nutrients. Both organisms have rhizospheres that fan out in the upper six to eight inches of the soil, with turf roots sometimes extending a foot deep. Yet when both are put in proximity, the turf wins.
Fertilization

Turf roots produce allelopathic chemicals that inhibit tree root development. They are also more fibrous and therefore have a greater surface area with which to absorb water and nutrients. Making matters more difficult for the arborist, homeowners have come to demand lawns with the appearance of a golf course. Turf fertilizers will promote a favorable environment in which grass will flourish.

**Fertilize the turf and fertilize the tree?**

Conventional wisdom holds that turf fertilizers do not find their way to tree roots.

Lauren Lanphear of Forest City Tree Protection Company, Inc., in South Euclid, Ohio, has never noticed a change in the trees he cares for after the turf has been fertilized. In his experience, turf is an all-consuming competitor. “Without turf you could do surface applications of (tree) fertilizer. But where there is turf, the turf takes all the fertilizer,” he asserts.

“Turf is a great filter for nitrogen,” agrees Jim Jenson, fertilizer product manager at Lesco, Inc. He cites research scientists and nurserymen alike suggest that arborists perform soil and/or leaf tissue tests when first arriving at a new site and every few years afterward. This is especially important for keeping a handle on the treatment progress of a nutrient deficiency. Soil and leaf tissue analyses give the arborist information about nitrogen, phosphorous, potassium, calcium and magnesium, as well as a recommendation of how to amend the soil if there are deficiencies or toxicities. Soil tests will provide additional information about soil pH and organic matter.

Dean Hanson at the Central Analytical Laboratory of Oregon State University points out that getting a sample for a leaf tissue analysis is often easier than getting a representative sample of soil from the rhizosphere of a tree. This is because the soil has pockets of differing pH's and nutrient levels. Plant tissue analyses cost around $35 and take about two weeks to receive the results. Soil analyses cost between $5 and $15 and take about a week.

Most large universities and some private labs will perform both soil and foliar nutrient analyses by mail. All that is required of the arborist is to contact the lab for a collecting kit, obtain a sample, send it to the lab and await the results. Some labs and their phone numbers are listed below.

- **Cornell University Nutrient Analysis Lab**
  - 607-255-4540

- **University of Maryland Nutrient Analysis Lab**
  - 301-405-1349

- **Ohio State University Research and Ext. Lab**
  - 330-263-3760

- **Oregon State University Central Analytical Lab**
  - 541-737-5716

Leaf samples are sent to labs like this one at Oregon State University. Lab technicians dry down the leaves, crush them up and perform various chemical analyses to determine nutrient levels within the plant.
Grass Mulch

Fall, will help to ascertain the amount of leaching that will take place. He notes that it is best to apply small amounts of slow-release fertilizers on a frequent basis to reduce leaching.

Migration?

It is common for turf to be viewed as a filter for everything that falls into the soil. However, the fact that trees' feeder roots grow in proximity to turf roots near the soil surface has led some to speculate that applications to the turf should be viewed, at least partially, as applications to the tree. While scientists have agreed for years that turf and trees are in competition with one another for resources, it is unclear as to whether turf fertilizers, themselves, contribute to the healthy growth of trees.

“I’d like to see a project in the future where people fertilize the grass at recommended rates and observe the caliper growth of trees,” muses Dr. Elton Smith, an expert on tree fertilization who recently retired from Ohio State University. He notes that not much research has been done on this subject. Until that time, arborists will have to carry out their own observations of turf fertilization and how it affects the trees under their care.

Robert Kelly of Big “O” Tree and Lawn Service, Inc. in Staunton, Va., is a proponent of the theory that turf fertilizers are taken up by the tree. He declares, “Internodal growth is much larger in juvenile trees growing in turf. You can almost date when the lawn went in. My conclusion is that the trees aren’t getting the right proportion (of nutrients). The wood is very soft and the root system isn’t well-developed.”

The main absorbing structure of the tree root is the tiny root hair which is responsible for making mycorrhizal associations. Mycorrhizae, in turn, give trees somewhat of an absorptive edge in the nutrient scramble. Dr. Wayne Sinclair, professor sponsored by the United States Golf Association (USGA) at the Squaw Valley watershed in Lake Tahoe, Calif. The study measured nitrogen levels in watercourses near the golf course to find out how much nitrogen was lost after the greens were fertilized. The study found more nitrogen in the watershed upstream from the golf course than downstream.

Turf fertilizers are often quick-release, meaning they have a high percentage of water-soluble nitrogen and thus can be leached into groundwater or absorbed by tree roots more quickly. Nevertheless, Jensen maintains that, when applied properly, they are absorbed by the turf and don’t reach trees or nearby groundwater.

In his report, “Loss of Nitrogen and Pesticides from Turf via Leaching and Runoff,” James T. Snow, national director of the USGA, lists proper fertilizer application regimes for turf. He states that estimating the leaching capacity of a particular soil, as well as how much water will be applied, either by irrigation or rain,

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Photo courtesy Morton Arboretum

Compared to tree roots growing in the presence of turf, tree roots under mulch are fibrous and able to spread out in every direction. Turf roots out-compete tree roots for water and minerals and produce chemical inhibitors that stunt normal tree root development.
of plant pathology at Cornell University, explains that high-nitrogen synthetic fertilizers, such as turf fertilizers, may temporarily reduce mycorrhizal activity. From this it can be inferred that turf fertilization, performed four times a year, has the potential to cause repeated, brief setbacks for the tree.

There is a possibility that turf fertilizers will encourage too much top growth on newly transplanted trees that cannot support such activity. Grass fertilizer, points out Marc Dantuma of Nu-Arbor Tree and Shrub Care Products, Inc., is high in nitrogen. If that fertilizer were to migrate, the tree would pick up too high a ratio of nitrogen in comparison to the other nutrients it needs, causing excessive top growth.

Turf fertilizers may cause a flush of new growth on already established trees as well, creating succulent tissues that act as avenues of infection for diseases like dogwood anthracnose. A flush of new growth also results in decreased photosynthate reserves that could have been used to make phytoalexins, the plant's defense chemicals. It is important to note that these are all unproved concerns about the dangers of turf fertilization. However, they show that much more research is needed on this topic.

Scott Guiser, Penn State county extension agent for Bucks County, Penn., is of the opinion that enough nutrients migrate from turf to tree that fertilizing a tree is unnecessary. He believes that on reasonably fertile soils, which can be determined by soil tests, trees probably have all the nutrition they need.

"I'm looking out my window at a pin oak on about 20,000 square feet of turf," Guiser says, "and it looks good. I know the guys here don't fertilize it or the turf." He urges arborists who are going to fertilize a tree to subtract what is given to the turf from what they give to the tree. He does stress, however, that fertilization for trees with restricted root systems is still important and states, "This is where an arborist can really help."

Dr. George Good, Cornell University professor of ornamental horticulture, agrees with Guiser. He cautions that tree fertilization on top of turf fertilization may cause pests, like aphids, to be attracted to the high-nitrogen trees.

Other turf-tree issues arise with soil pH. Most trees prefer a somewhat acidic
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THIS FALL TAKE A NEW LOOK AT TREE HEALTH CARE.
environment, while grass grows best at neutral pH. At higher pH levels, micronutrients such as iron, manganese and zinc are often deficient. Fortunately, micronutrients are now available in systemic implants and injectable to offer a temporary remedy for ailing trees. However, close monitoring is required to make sure the deficiency does not recur, since soil pH remains high.

Ammonium-based fertilizers such as ammonium nitrate and ammonium sulfate are often recommended to lower soil pH. If over-applied, these fertilizers may swing soil pH too far toward the acid end of the spectrum, causing important cations like calcium and magnesium to be deficient. These cations improve soil structure by bringing soil’s colloidal particles, clays and humus together into aggregates. Therefore, with over-acidification, aggregation does not occur and soil structure is off-balance.

**What’s an arborist to do?**

So, the question remains: are turf fertilizers a problem for trees? What should an arborist know about the turf fertilizers used on trees under his care?

Dr. Tom Smiley, a plant pathologist at Bartlett Tree Research Labs, affirms that some turf fertilizer will reach the tree. In his opinion, though, not enough will migrate from the turf to affect the tree markedly. Smiley explains that turf fertilizer is usually applied four times a year at a rate of one pound of nitrogen per 1000 square feet. By the time that fertilizer has made its way to the tree roots, only about a quarter pound of nitrogen per 1000 square feet remains. Since a tree may require from three to six pounds of nitrogen per 1000 square feet per year, Smiley argues that turf fertilization will not be of any consequence to the tree.

Others in the field are more equivocal. The Morton Arboretum’s Dr. Gary Watson answers the plaguing question by explaining that migration depends on:

- the rate and method of application. If too much is applied, leaching is bound to happen.
- the soil type. If the soil is predominantly sandy, soil water is moving faster, and the fertilizer moves with it.
- the size and stage of the tree. If a tree is young and has very shallow feeder roots, it is more likely to be affected by turf applications.
- the goal and objective of the fertilization itself. “If you want to grow a tree like a corn plant so that it gives shade before you die, then fertilize it,” says Watson with a laugh.

The best thing an arborist can do until more is known on this subject is to make careful observations to see if the trees seem over-stimulated and weak after turf fertilization. The arborist should know the region—its soil types and rainfall patterns—and the goals of the homeowner inside-out. Dave Ahlum of Arbor,
I was very skeptical of the value of Roots until I ran several field tests. I had eight 3 inch caliper Kwanzan cherry trees on each side of a commercial entrance. One side was treated heavily with Roots, the other side received the same fertilizer and water, but no Roots. One week later, I removed a tree from each side. The cherry tree treated with Roots had root growth over 8 inches long in one week! The untreated tree had NO root growth.

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Fertilization

Inc., in Hilliard, Ohio says, "Ultimately it is up to the homeowner to decide: Do you want the tree or the nice grass?" But, the arborist should emphasize to homeowners that trees outside the forest are stressed. Soil tests and leaf tissue analyses can help an arborist become a better ecologist and communicate more effectively with homeowner. [Refer to the table on nutrient analysis for more information on this subject.]

"Some people only look down; some only look up," muses Nicole Campbell, marketing manager at Growth Products. It is important that the arborist not only look up at the trees, but also down at the ground, with its grass and soil microbes, to gain a comprehensive view of the entire landscape ecosystem.

Sunita Khosla is pursuing a degree in plant pathology at Cornell University.

Fertilizer Product Companies

The following companies will be able to provide arborists with more information about fertilizer products that give trees an advantage over turf:

Creative Sales, Inc., makes slow-release systemic fertilizer implants for treating micronutrient deficiencies. Phone: 800-759-7739.

The Doggett Corporation sells soil-applied mycorrhizae, organic soil amendments and fertilizers, as well as a synthetic fertilizer blended with humates. Phone: 800-448-1862.


Growth Products makes liquid fertilizers as well as an organic, liquid, soil-injectable compost for improving soil structure and root growth. Phone: 800-648-7626.

Haimbaugh Enterprises, Inc. - Tree Feeder Division makes fertilizer in a tube. Phone: 800-822-8733.

Lesco, Inc., is a manufacturer of a wide line of fertilizers, including turf fertilizers. Phone: 216-333-9250.

Monterey Lawn & Garden - manufacturer and distributor of micronutrients, as well as slow-release fertilizer. Phone: 209-499-2100.

Moyer & Son, Inc., manufactures liquid fertilizers and micronutrients. Phone: 800-338-0836.

Nu-Arbor Tree and Shrub Care Products, Inc., makes fertilizers, root enhancers, and foliar fertilizers. Phone: 888-773-8777.

Plant Health Care, Inc., makes organic fertilizers and soil conditioners with mycorrhizal fungi. Phone: 800-421-9051.

Remke Enterprises makes slow-release fertilizer tablets for general tree fertilization as well as micronutrient tablets for deficiencies. Phone: 630-810-1662.

Roots, Inc., makes organic biostimulants and chelated micronutrients to enhance stress tolerance and improve plant health. Phone: 800-342-6173.

Tree Tech Microinjection Systems manufactures tree fertilizers in plastic microinjection units. Phone: 800-622-2831.

W.A. Cleary Chemical Corporation manufactures and distributes liquid fertilizers and micronutrients. Phone: 800-524-1662.
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Nu-Arbor offers the new Kioritz soil injector tool for chemical or fertilizer application. The 6-pound injector is hand-held and carries three quarts of liquid material. It is easily calibrated and has a semi-transparent tank allowing the user to observe the contents from the outside. An anti-corrosive material is a component of the injector's simple, sturdy construction. The injector is especially useful for applying fertilizer products available from Nu-Arbor as well as systemic soil insecticides. Spare parts are readily available. For more information, contact Nu-Arbor Products at 888-773-8777; Fax: 616-364-7616. Email: grdarbor@aol.com.

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The new Ladder Caddy is an attachment for increased mobility and safety when moving ladders. The caddy features 20-inch inflatable tires that balance the weight of the ladder, lightening the load by 75 percent. The tires allow easy movement over rough terrain at work sites while minimizing back strain and injury. The caddy can be mounted in five to ten seconds and remain on the ladder while in use. It allows the user to place items, such as tool boxes and building materials, on top of the ladder to take to the work site. It is available in one- or two-wheeled models. For more information, contact Sur-Loc, Inc., at PO Box 750, Fremont, IN 46737. Phone: 800-223-7517; Fax: 800-882-3425; Email: bswager@dmc1.net.

Compact Technologies, an OmniQuip International Company, introduces the Scat Trak 1800C skid steer loader series. The new loader is rated at 1850 pound capacity with optional counterweight. A key feature of the loader is the servo transmission control that reduces the operator's lever effort, as well as sound within the cab. Other features include an 80 hp Perkins diesel engine, a self-leveling bucket, and 19 gpm hydraulic pump that provides added power to optional attachments. The 1800CX model offers 47 gpm high flow auxiliary hydraulics. Forward tilting ROPS, a swing-out tailgate, a hinged-top engine cover and a lift-out floor panel allow easy access to components. For more information, contact Compact Technologies, 369 W. Western Ave., Port Washington, WI 53074. Phone: 414-284-5571; Fax: 414-268-8931.
The Davey Tree Expert Company recently introduced a line of yard and garden tools to retailers nationwide. The collection includes loppers, shears, pruning saws, rakes, shovels and spades that come with a lifetime limited warranty. They are made of forged and treated Sheffield tool steel and have hardwood handles. The tools also come with a gardening tips booklet as well as an 800 number that connects to Davey's technical support center. For more information, contact Davey Tree Expert Company, 1500 N. Mantua St., Kent, OH 44240. Phone: 800-445-TREE; Fax: 216-673-5408.

SawJammer's foot protection provides a barrier against high speed blades. The slip-on is UL Classified and meets ASTM and APA standards. It also meets the requirements for OSHA 29CFR 1910 which states that "foot protection worn by employees be equipped with material that is cut-resistant to chain saws." The slip-on is built with 8 layers of Kevlar that jam a chainsaw to a stop in less than 1.5 seconds. It is fastened around the wearer's boots by nylon straps with quick-release clips. The cover is soled with a durable, non-slip material that is available in different designs to suit various applications. The outer layer of nylon Cordura cleans up quickly with a soft brush, soap and water. For more information, contact SawJammer, PO Box 11395, Baltimore, MD 21239. Phone: 410-325-6860, 800-969-9276; Fax: 410-483-4066.

Two new models for the Posi-Track line were recently introduced by ASV, Inc. The two models, the HD 4500 and the HD 4520, have an operating weight of 9,000 pounds and feature greaseless undercarriages along with other low-maintenance features. The HD 4500 is powered by an 80 hp John Deere PowerTech 4.5 liter diesel engine, and the HD 4520 is powered by a 115 hp John Deere PowerTech 4.5 liter turbo diesel engine. The models also feature 114-inch lift height, 5,675 pound tipping load and a ground-hugging suspension system. The rubber-tracked HD machines exert only 3 pounds ground pressure per square inch when outfitted with the loader assembly. For more information contact, Gary Lemke, ASV, Inc., Grand Rapids, MN 55744. Phone: 218-327-3434, 800-346-5954; Fax: 218-327-9122.

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TREE CARE INDUSTRY - SEPTEMBER 1997
We're Not Loggers!

A n article in the August 1997 issue of Arbor Age magazine ("When Buying Safety Equipment. It’s No Time to Count Pennies") referred readers to the National Arborist Association as a resource for answering questions regarding OSHA standards. While we appreciate Arbor Age's acknowledgment of NAA as the industry expert in OSHA matters, we would be remiss in our responsibility if we did not clarify some incorrect information that appeared in the article.

Author James S. Alderson refers to 29 CFR 1910.266 as the OSHA standard that requires all employees who normally or occasionally use a chain saw to wear personal protective clothing. Certainly the required protective clothing is in order during any aspect of arboricultural operations. Unfortunately, the standard referred to is a logging industry standard which does not, and should not, apply to the commercial tree care industry. The scope and application from the Code of Federal Labor Regulations reads as follows: "29 CFR 1910.266 Logging Operations ... (b) Scope and Application. (1) This standard establishes safety practices, means, methods and operations for all types of logging, regardless of the end product of the wood."

The commercial tree care industry has long fought the battle for a clear distinction from the logging industry. Arborists know that the work is far different from the work of loggers, and that the two industries, by necessity, have very different safety needs. NAA staff has been very active in working with OSHA to define specific standards for commercial tree care. In face-to-face meetings, several OSHA officials have acknowledged that commercial tree care and logging are completely separate industries. While we agree that it is the responsibility of every employer, foreman and crew member on the job to ensure safety, we believe that it is confusing and counter-productive to cite federal standards that were not intended for this industry.

For the safety record, when operating a chain saw, arborists must wear a hard hat, eye protection and hearing protection. Employees regulated by OSHA 1910.269 must wear cut-resistant legwear and cut-resistant boots. Chaps and steel-toe boots are not specifically required. When operating a chipper, arborists must wear hard hats, eye protection, and hearing protection. The Arbor Age article talks about the use of gloves. NAA implores all arborists to be careful when making glove selections. Gloves for use around chippers should slide easily from the hand, and should not be the gauntlet type. If an accident happens, it is better for a glove to go through the chipper by itself, rather than drag an arm along with it.

NAA agrees with the general conclusion in the article that no employer should forego personal protective equipment due to the cost. However, we would like to remind all arborists that purchasing decisions should be made by evaluating the needs of crews and required equipment specifically defined for the commercial tree care industry. Because manufacturers might sell to many different industries, it is the responsibility of the purchaser, not the seller, to know what is required for individual work sites. An impartial resource should be consulted if necessary.

Anyone with questions concerning safety equipment and OSHA regulations can call Amelia Reinert at NAA (800) 733-2622.

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S
hould you operate a new piece of equipment without understanding the manual? No! Can you? Possibly!

Should you appraise trees without understanding the manual? No! Can you? Possibly!

The manual to which I refer is the Guide For Plant Appraisal, authored by the Council of Tree and Landscape Appraisers (CTLA), and published by the International Society of Arboriculture (ISA). The current eighth edition was revised and published in 1992.

THE GUIDE is a sophisticated publication that describes the methods of appraisal and the factors used to perform a valuation. Procedures are explained, and the necessary tools are listed. Regulatory factors affecting tree appraisal, professional matters and responsibilities of an appraiser are presented. Numerous examples and exercises illustrate the procedures.

A companion publication, Guide for Plant Appraisal Workbook, is available for plant appraisal workshops and to help an appraiser through the Replacement Cost and Trunk Formula methods of appraisal.

The eighth edition of Guide For Plant Appraisal allows for each region of a country to develop local Replacement Tree Costs, the Basic Price (cost per unit of trunk area), as well as a species-rating guide. This has previously been done on a national basis for Canada and the United States. Many of the local ISA chapters met with local arborists, landscape architects, landscape contractors, nurserymen, consultants and university personnel to develop such a publication.

This companion guide is essential in completing the appraisal puzzle.

In addition to the above, CTLA has developed the Field Report Guide for Trunk Formula Method which is a manila folder that takes the appraiser through a step-by-step process to accomplish the trunk formula method of appraising. This is a useful tool and is impressive when presenting an appraisal to a client or in a court of law.

To further aid the plant appraiser in his or her practice, CTLA has recently published the Field Form Report for Cost of Cure, which is an eight-page document containing the steps and forms to be used when extensive plantings and hardscapes are to be appraised.

In addition to all of the above, there have been, and will continue to be, workshops set up on a regional basis to help the beginner, as well as to hone the experienced appraiser’s skills.

In order to be able to properly perform appraisals, the appraiser should have:

- Guide For Plant Appraisal
- Guide for Plant Appraisal Workbook
- Regional Species Rating Guide, Tree Replacement Costs and Basic Price
- Field Report for Trunk Formula Method
- Field Form Report for Cost of Cure

All of the above are available from CTLA member organizations.

Remember, the cost of replacing a destroyed or damaged tree with a new tree from a nursery may no longer by an acceptable appraisal of damages.

Lew Bloch is the ALCA Representative.
OSHA Still Doesn't Get It

AFTER all of the consternation and teeth grinding that it took to convince OSHA that the “Missouri 500 and “Maine 200” style cooperative compliance programs were not a good idea, the “new, friendlier OSHA” has offered a draft of another cooperative compliance program (CCP) that they eventually hope to run in all federal OSHA states. Evaluation of the program by the National Arborist Association reveals that there is little difference in spirit between the ill-fated Missouri 500 and the current version of cooperative compliance.

While OSHA proclaims the advantages of the new CCP’s methods of uniform data collection, uniform program implementation, and removal from primary comprehensive inspection lists for cooperating employers, beware of the real trade-off of this program. Participation means offering OSHA access to all company facilities and files without a warrant. It also means having OSHA act as an intermediary between employers and employees and granting regular wages and time for employees to inspect job sites and participate in safety meetings. Employees must also be given the authority and tools (budgets, reports or other information) necessary to hold others accountable for safety risks.

Employers must pay the citations anyway, except now OSHA has free access to every inch of the facility and every employee who might have something to say. Of course, employers can choose not to participate. Should that be the choice, employers can, in OSHA’s own words, “choose the type of OSHA they want to deal with ...” For a little extra punch, the new CCP gives OSHA the authority to subject employers to paperwork inspections for verification of submitted Form 200s.

Staff from the National Arborist Association drafted a response to OSHA’s proposal that was somewhere between disbelief and outrage in tone. The program came as a particular shock because it was hand-delivered during a meeting at the Department of Labor at which OSHA officials very cordially discussed the agency’s attempts to redefine itself as a friendly regulatory authority that had the combined best interests of employer and employee at heart.

It is reasonable to believe that the vision was expressed in earnest, but how do you get a jailer to understand the difference between providing a nicer jail and providing freedom? This CCP proposal proves that although OSHA might be trying, the powers that be still don’t get it.

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

On a positive note, the above-mentioned meeting in Washington proved fruitful in many other areas. OSHA director of compliance programs John Miles and deputy director Richard Fairfax offer real hope for the future. Both gentlemen were amenable to discussing particular concerns of the commercial tree care industry and readily admitted that commercial tree care cannot reasonably be tucked under the standards of other industries. NAA staff and OSHA have opened the door to working together to create standards that are appropriate for the industry.

Meanwhile, on the Congressional front ... OSHA will receive an additional $12 million in funding next year, $11 million dollars less than President Clinton’s request. Both the House and Senate pending appropriations bills would halt development of an ergonomics standard for one year; however, the Senate version of the bill would allot more money to compliance enforcement efforts. The House prefers cooperative programs. Even with more money in the pipeline, OSHA cannot forget about reform. The issue did not go away during the August recess, and many employers are testifying before the House Subcommittee on Workforce Protections that the new, friendlier OSHA’s compliance programs did not offer any substantial gains in protecting workers or improving OSHA’s relationship with employers.

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

By Sachin Mohan

Is that stately maple in the front yard sick? Is it dangerous? Can you pinpoint where pockets of decay are and what the extent of decay is? All these questions can now be answered with a degree of accuracy that was unattainable until relatively recently. Detection, confirmation and quantification of suspected internal defects of trees can be recorded using sound, electricity and resistance. Several devices are on the market to help arborists quantify levels of decay.

**Resistograph**

The Resistograph is a mechanical drilling machine with a constant drive, that measures the drilling resistance along a needle path when inserted in a tree. The change in drilling resistance can be correlated to defects in the tree, open cracks, areas of severe decay, hollows, variations in ring structure and remaining wall thickness.

The drill penetrates the tree with a constant feed up to a depth of 300 mm. A crank and flywheel are driven by an electric motor with a rechargeable battery. Drilling resistance at the tip of the needle is measured and transferred.
to an intelligent gearbox, which stimulates a pointer on the top of the device. The pointer scratches out a waterproof printout of results.

"This is one of the best developments in some time," says Denice Britton of Britton Tree Service in St. Helena, Calif. “We use it for detection of decay while consulting or working on a property. As we are taking care of a tree, we can also check how the tree is reacting to the treatment.”

Taking multiple readings is easy. The user simply runs the device backwards, which releases the wax paper and allows for new paper to be inserted. The device should be aligned perpendicular to the tree with the needle pointing in the radial direction towards the pith of the tree to enable the needle to hit the growth rings head on.

Of course, using the drilling instrument does involve wounding the tree. “A minor level of damage is done to the tree considering the amount of information which can be extracted.” concludes Larry Costello, Environmental/Horticulture Advisor with the University of California. Costello and others at the University of California are conducting a study of the instrument to determine its accuracy and applicability in the industry.

One application for the Resistograph is utility pole inspections, which take about one minute for each reading. Decay at or below ground level may be detected by drilling underground at an angle of 45 degrees. Currently, most of the poles are replaced after a stipulated time period or checked for failure using the age old “sounding” process. Since the cost to replace each pole runs around $2000, utilities are vitally interested in making sure that a pole in fact need replacing.

The Resistograph comes in two versions, the M or the F series. The F line is the less-costly option. Both are manufactured by IML - Instrument Mechanic Labor, Inc. The company was founded by Eric Hunger about ten years ago, in Sandhausen, Germany and was later moved to Wiesloch, Germany.

IML manufactures other interesting decay-detection devices. Among them are:

**Endoskopy:** A fiberoptic endoscope for defect detection. With a small, flexible glass-fiber tube, interior defects of a tree can be photographed or recorded on video camera. This instrument provides a diagnosis for trees in the same way that CAT investigate human body.

**Sound Impulse Hammer:** This instrument uses the speed of sound to detect

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"We use it for detection of decay while consulting or working on a property. As we are taking care of a tree, we can also check how the tree is reacting to the treatment."
Decay Detection

decay. The speed at which sound travels varies considerably with changes in the density of wood. The hammer records different readings for wood that is decayed or has cracks, enclosed bark or hollows. A comparison is made between radial sound velocity of trees with and without defects to gauge the extent of damage in a tree.

Shigometer

These new products from Europe are a welcome addition to the three instruments arborists have been using for years. The most sophisticated of those already on the market is the Shigometer, the brainchild of Dr. Alex Shigo. “This is the most advanced technology in the market, which can even detect an opportunity of decay,” says Mike Fayle, products manager with Osmose Wood Preserving Co., in Buffalo, NY., which manufactures the Shigometer. “Different readings are needed for trees and poles, so you must have a knowledge of how to use the Shigometer.”

The Shigometer is a battery-operated, lightweight ohmmeter that generates a pulsed direct electric current and measures resistance in thousands of ohms, which is the unit of resistance. Current is defined as the rate of flow of charge per unit time. When electric current is passed through a conductor, there is some resistance offered to this flow of charge. This resistance is different in different conductors. This is the basic principle of a Shigometer.

When current is passed through the trunk of a tree, changes in the level of resistance reveal sickness or decay in a tree.

The condition of the tree is generally reflected by the moisture and ion concentrations. These remain fairly constant in healthy tissues and follow regular patterns. If the tissue is infected, more or less resistance is offered, than a healthy tissue, when current is passed through the tissue. The magnitude of change in readings indicates the degree of tissue deterioration.

“You need to have a knowledge of trees to use instrument,” confirms Shigo. “People are looking for a decision maker in a product, which can give them, in writing, what the vigor of the tree is. Well, this meter will not make a decision for you, but if interpreted properly, it can detect the earliest stages of decay in a tree. The vitality of the tree can be detected with a high level of accuracy.”
Arborsonic Decay Detector

Arborsonic works on the principle of ultrasound. Sound travels with a frequency, which depends on the speed. Ultrasound travels quickest in solid mediums, and in trees the mode of travel is through the cell walls.

Two properties of ultrasound make this product work:
- there is no difference in signal velocity in different types of wood, since the cell wall material is similar in hardwoods and softwoods
- ultrasound waves stay in the medium in which they travel.

A signal with a velocity of 2000 meters/second is sent through the area where detection is required and picked up by a receiver set at 180 degrees. The signal tries to find the fastest path to the receiver and will not go through any voids, as this involves a change in medium (solid to air). Therefore, the signal takes an alternate path around gaps and continues traveling at the same frequency through intact cell walls. When this occurs, the amount of time the signal takes to reach the receiver increases. This increase in time will tell the user that there are voids in the trunk created by decay.

Arborsonic Decay Detector is manufactured by Fujikura Europe Limited, a multi-billion dollar international company with products and services covering the telecommunications, power, electronics and automotive sectors.

DDD200

The Decay Detecting Drill 200, manufactured by Sibert Technology in Guildford, England, uses a 1 mm diameter wire drill (200 mm long) to probe the wood. A constant load is applied by the operator and the results of each test are recorded on a drum-type chart recorder built into the body of the instrument.

The arborist receives a graph depicting the speed of the penetration of the drill, which is directly proportional to the difference in density between healthy and decayed wood. The constant force applied by the operator can be corrected by watching a series of LED’s (Light Emitting Diodes) mounted on the top of the equipment.

Readings can be taken in under a minute and the light weight of the instrument makes it easy to use. The rechargeable battery power supply can give up to 125 readings at a stretch.

“The DDD200 is insensitive to any movements while taking the readings,” explains Doug Shannon, president of Shannon Technology Corporation, the exclusive distributors of this product in North America. “This product is more apt for field applications. We send a videotape to each inquiry that comes in for the product. This gives the end user a feel of the product and highlights the benefits of the product, before the purchase is made.”

These are some of the finest tools that technology has to offer the modern arborist. And they are only getting better as more research is done to enhance features. These products allow decay to be detected in its earliest stages in a very cost-effective way. Damage to property and life can be avoided with more widespread use of these early decay-detection instruments.

Sachin Mohan is staff writer for TCI magazine.
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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Projecting Your Best Image Through Publicity & Advertising

By Bill West

If you are getting ready to change your advertising, try it for the first time or analyze why your advertising might not be working as well as it could be, below is a great formula to follow. It is a step-by-step process that will put your business in front of your audience with the information and message that it needs to hear.

Communication objective

Why do companies want to communicate to the public through advertising or publicity? I once thought that it was to increase business, but that is not necessarily the case. We had a major metropolitan newspaper approach us with an idea for a $2 million dollar campaign. It turns out their plan was just a rebuttal to something the other newspaper did. My partner said, "So you are going to spend $2 million to send a cross-town memo?"

We didn’t get the business, and I have never forgiven him.

1. Why do you want to publicize your business?

You must be clear about why you are advertising and also whether it's going to be a one-time shot or a long-term campaign. Sometimes you may simply want to introduce your name to the public, but for the most part you want to get more business.

If your ad is a one-time deal, then do it for all that it is worth. But if you are planning a campaign that will be sustained over time, start by creating a distinctive feel or tone, and have a clear idea of where you are headed.

Be sure that you stay consistent in your advertising as well. If your ads and your presentation are consistent—by that I mean your message, your format, everything about you is consistent—then you are not running a single ad anymore. Each ad becomes a part of who you are. You have an equity in your image, so that people will recognize your company for years, though the content of the ads may change. Potential customers will recognize your ad right away as your ad. In this way, every time you run a new ad in the same style, the common features will register with customers.

2. What do you expect from your efforts?

Understand your expectations. If you want to triple your business in six months, that's a great goal. But do you have the money to do it? How much will it take? People have very unrealistic plans about what advertising and publicity can do for their businesses, considering the amount of money they hope to spend. Even a great publicity campaign will probably need to be supplemented with advertising. Make sure that your goals are realistic within your budget.

3. How will you track your results?

Too often, companies don’t have any way to measure their results because they haven’t set up a system in advance. My partner and I work with some very big advertisers. We did some work for General Motors a while back, and when it was over we asked how the campaign worked. They weren't sure. If they’re not sure, who is?

When leads or new business prospects call, ask them how they heard about you. You want to know this because it will...
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**Management Exchange**

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55 ft. W.H. 50 ft. Aerial Lift CT, 1990 GMC Topkick, 5/2 Trans, 52,400 miles, 3116 Cat Diesel.


55 ft. W.H. 50 ft. LIZ Asplundh in Stock 1996 Ford, Diesel six speed, 30,000 GW, 3,730 miles. This unit has never been used.

**Management Exchange**

Management Exchange

**Management Exchange**

tell you which of your prospecting methods are working. They might say they saw your ad in the local paper or the Yellow Pages. They might have been referred from satisfied customers or from the National Arborist Association.

Decide how you are going to find out where your business is coming from. Track what’s working and what’s not working. Give different methods a fair shot. Don’t throw a little bit of money into the local paper then decide you’ve given it a fair shot. Be diligent about tracking and give your ads enough time and money to work.

**Taking aim**

Taking aim

After you have decided what your objectives are and you have a good method for tracking results, take aim. This is where you start being a manipulator of people. Advertising and publicity are really psychology. You want to get into people’s brains and change their perceptions. Sometimes you have to carry the weight of an industry to advance your own business.

For example, if there’s not much knowledge about arboriculture and the need for professional tree care in your area, you may have to educate the public about the entire profession as you are looking for business for yourself. It won’t do you much good to promote your company as the best if people aren’t inclined to pay for tree care services from anyone.

**1. To whom do you need to communicate in order to realize your goals?**

Before you act, make sure that you are acting in front of the right audience. Even the best advertising and publicity is wasted if it doesn’t land in front of the right people. We had a client who told us he wanted to advertise on a particular radio station and during two specific TV shows. I thought he had a scientific way of deciding all of this, but instead he told me that he chose his favorite radio station and TV shows.

**2. Where can you find the people who will respond to your message?**

A lot of people make the mistake of trying to reach everybody. You don’t have enough money to try that. Even McDonald’s segments its media, and they’re spending close to a billion dollars a year. Coca-Cola does the same thing. They have different advertising campaigns for different market segments. You can’t reach everybody with the same advertising, so you have to decide who your best prospects are and go from there.

Who is the most likely candidate to buy your services today? Past customers? New homeowners? People who are trying to sell their houses? Who can you spend money on that will produce the fastest results? That is where you start.

That is your first aim. That is your bull’s-eye.

Where can you find the people who respond to your message? Are they reading the newspaper? Are they listening to the radio? TV is expensive, so not many tree care companies spend ad dollars there.

You may not use any broadcast media at all. You may only try newsletters and flyers.

Hit your bull’s-eye. Find out where they are. Ask your current customers what they watch, listen to and read. Some form of communication will pull in people right away. Go there first, and go there seriously. Do it with enough money that you can track your results in a relatively quick period of time.

Your prospects are probably reachable by any number of methods, but you are looking for the most efficient ways. Before you spend money on any large-scale advertising, make sure that enough of your target market will respond that makes it worth paying for everybody who won’t.

Every time you spend money on advertising, you are looking for the opportunity to get those dollars back as quickly as possible. That is how you will build up your advertising budget.

When my partner and I started in business, we spent money on advertising
Looking into their heads

The best way to attract new customers is to find out about your current ones. You can do that in tactful ways. There is a company we talked to but didn’t work for that told us they trained their people to gauge the income of the homeowner and then recommend certain services and products based on the estimate. Since you are providing services at people’s homes, it should be fairly easy to estimate the average income of your customers.

Figure out from your current customer base the average income level among the people who purchase the different types of services you offer. Build on that. If you want to expand your customer base, you need to find out where they are and what they are doing. If they are members of a local conservation group, do you advertise in their newsletter? What about the PTA? If they ride bikes, get your flyers into the bicycle shop. The narrower your focus the less waste in your ad dollars. Once you’ve determined where you can reach the people who can benefit you, you need to get a clear understanding of their mindset. Advertising for customers is not about creating a message that is appealing to you. A real problem with advertisers is that they think they are talking to themselves. I don’t care about you. In fact, your advertising should be aimed at everybody but you.

Do you remember when Budweiser had Spuds McKenzie? Everybody on the board of the beer company hated the campaign. Nevertheless, the reason that it worked is because they were smart enough to know that they were not trying to appeal to beer drinkers sitting on the board of directors of major corporations.

To target your audience, start with your industry first. Right now, you’re competing with other companies. In a normal competitive scenario, companies compete for the same customers. When they decide to advertise, they are trying to do one of two things: take a larger slice of the same pie or make that pie bigger by expanding the market.

If nobody else is attempting to expand instead of taking a salary. So we really wanted to do it smartly because it was money that otherwise we could have spent on ourselves.
the market for tree care services, then you can. If other companies are trying, the awareness level is so much higher because others are throwing money at your customer base. If you can raise new issues with people, you have a chance. It’s generally cheaper and easier, however, to attempt to earn a bigger piece of the pie than expand it. Educating the public at large about the need and value of expert tree care is an expensive proposition. Your ad budget is probably not big enough.

On your own, can you realistically expand the number of people who will regularly purchase tree care services? What do people think about your services? Do they even consider the need for what you do? These are perceptions you want to understand because you are interested in their mindset. If they have any resistance to hiring someone to care for their trees (if they have lived in the same house for 20 years and never had anyone care for their trees), go after that first. Disarm these people immediately.

You need to convince people of the value and the necessity of tree care services. And when they decide to purchase those services, they will only think of your company.

So find out what they think about you. Again this is as simple as asking people. Find out what resistance levels they have. This starts to help advertising agencies to begin to formulate an approach. Once you’ve made this assessment, you’re in a position to approach your market in a relevant and compelling way. The issues you found to be most relevant to your audience should form the basis of your message. Find out what matters to these people.

I can’t tell you how many times I get coupon offers for things I would never be interested in. Offer potential customers what they want. Ask them what they want, and also think of things they might want. The technology that operates intermittent windshield wipers existed for decades, but nobody asked for it. Now we can’t live without them. Think about what you could be offering that you aren’t. Think for your customers, since they won’t want a service they don’t know exists. Then ask them before you spend any money trying to sell your idea.

Formulating your approach

1. Talk to them, not to yourself

Use language that your customers use. If homeowners in a wealthy suburb are a market that should be approached formally, approach them formally. Advertising and publicity should be designed for everybody but you.

2. Emphasize benefits over features

You may have state-of-the-art equipment, but the customer doesn’t care. The caller wants to know how much, how soon, how good are you and is it a good value? These are the things they want to know, so talk to them about things that matter to them, not things that matter to you. I know you’re proud of your equipment or your worker-safety record, but that doesn’t matter to a customer. He wants the confidence that you’re going to do the job right, and he wants you to explain that to him.

Bear in mind that people aren’t always attracted to the lowest price. If you give them a benefit that’s worth paying more for, they will pay more. On the other hand, if you know you have customers who are only price sensitive, then only talk about price.

3. Promise something specific in your advertising.

What I mean by a promise is not simply ending an ad with “we promise.” You can demonstrate promises. Be clear that you communicate the promise to customers as to what they will receive if they hire your tree care service.

4. Position

Separate yourself from the competition. Don’t assume that people know who you are and what you do. Create people’s impression of your company and your profession. If you want to be the tree care company with low prices, do that. But be something. Position yourself and differentiate yourself from the rest of the market. In quality and style and content, your communication should reflect and reinforce the position to which you aspire. Set your goals and keep hitting them.

Interestingly, your perception by the marketplace may not be your ranking in the area. You can change your position without necessarily changing your ranking. You might be number three, but you might be perceived as number one because of the way you advertise.

Remember those old Xerox commercials that featured a parade of copier salesmen who all said “And it’s as good as a Xerox.” Finally, the last salesman says, “One other thing...” The customer interrupts and says, “I know, it’s as good as a Xerox.” The salesman answers, “Actually it is a Xerox.”

That was a great ad, because we understood that Xerox was the copier everybody else tried to be. It was a great preemptive strike on the market. What you need to do is stake out your position and reinforce it every chance you get.

5. Be Recognizable.

As much as possible, create and maintain a consistent style, so that every time you advertise the public recognizes you as you. This creates equity for you in the minds of your prospects and customers. A single ad is then more than an ad; it’s part of the big picture the public holds of you.

Elements of execution

Most small business people could do for themselves everything I have discussed up until this point. But gathering information is different from executing a strategy. You don’t want to trip at the finish line by saving a little money at the critical stage. Besides, you have a business to run.

Nevertheless, whether you’ve decided to try it yourself or you’ve hired somebody and you want to evaluate what they are doing, you should understand these five points:

1. Engage your audience.

If you’re calling them on the phone,
Every year our innovations are eagerly anticipated by both arborists and our competitors. Features such as our PolyChain® drive, remote control, wireless remote control, four wheeled stance, torsion flex suspension system are first sneered at by our competition, then eventually copied. We decided that instead of whining about all the copycats, we’d rather dedicate ourselves to creating the kind of stump cutter that will make your job easier. So, it comes down to what you want, the innovator or an imitator?

See us at TCI EXPO '97!
if you’re getting in front of them via the mail, if you’re send a newsletter, if you have a print ad in a newspaper or magazine, regrettably they’re not thinking about you. If you polled everybody who is not involved with your business and asked if they were ever thinking about you at any time, they would probably say no.

Your business doesn’t matter to anybody else, though it matters like heck to you. Overcome disinterest by engaging them. What matters to your potential customers? You know because you did the research.

You are going to take what matters to them about your business and present it to them in a way that they will say, “That does matter to me. I’ll pay attention here.”

3. Integrate information

If you put information into a story and integrate the information, people will remember. Mix the facts presented in your advertisement with something that is interesting. People don’t remember facts in a vacuum. When you work facts into a story that is interesting, people will remember. Using stories or parables can be an incredibly powerful teaching tool. Give people facts and your message in a context that they operate in their lives.

4. Differentiate yourself

Tree care can be expensive, and customers want somebody they can trust. Figure out a way to set your company apart from the competition with both the style and content of your message. Don’t spend your money to echo someone else’s offer or mimic their style. Be special to your audience.

5. Invite them

Ask your audience to contact you, and give them enough information (phone number, address ...) to act. Specific offers should relate to the hot points you uncovered in your assessment stage. Invite people to think and direct them wherever you want.

Conclusion

If you educate people about something they will have higher interest and awareness. If you’re the person who educated them, they will beholding to you.

Get in front of groups anytime you can. I have somebody in Florida whose job is to get me interviews on radio shows. It’s just a great opportunity. People will call me afterward and say, “I heard your show. We’d like to get you on to do some work for us.” You can be one of those guys. People are interested in trees. So look for any opportunity you can to put yourself forward as the expert. The media will keep coming to you any chance they can.

The object in both advertising and publicity is to get inside your potential customer’s brains. You may think that people have to have a problem with a tree for your advertising to matter, but that’s not true. Keep your name in front of the public just enough, so that when a problem does arise they will think of you.

You will know how often you need to advertise to keep your name on people’s minds, because you have done your research. You know what stations they listen to and what newspapers they read. When a need arises, they will think of you and nobody else.

Bill West is a partner in two award-winning advertising agencies. He may be reached at 713-789-3751. This article was excerpted from a seminar presented at the National Arborist Association’s 1997 Winter Management Conference. For more information on attending the NAA’s 1988 conference, contact Carol Crossland at 800-733-2622.
The new ANSI A300 Pruning Standard is THE tool to help us communicate more clearly with our customers, our employees, and each other. You’ll want to incorporate this standard, created by arborists for arborists, into your daily activities.

And now, we can help you do that – quickly and easily – with the new video, Pruning Standards and Techniques for the 21st Century, produced jointly by the NAA and the ISA.

This comprehensive video is the ideal complement to ISA’s Tree Pruning Guidelines. It will help you accelerate right through the learning curve with the plain language answers you need to make ANSI A300 work for you!

Call, fax, or mail your order today. The 21st Century of Tree Care is just around the bend.

RETAIL: $90.00; NAA & ISA MEMBER DISCOUNT PRICE: $60.00
Shipping and handling: $6.50 in the U.S., $20.00 outside the U.S.

Send me _____ Pruning Videos, at $_______ each.

Enclosed is $__________ or please bill my □ Mastercard □ Visa

Number: __________________________ Expiration Date: ______________________

Company Name: __________________________

Contact/Credit Card Holder Name: __________________________

Address: __________________________

City: __________________________ State: _______ Zip: __________________________

Phone: __________________________

Please mail this coupon with payment, or fax with credit card information to:
The National Arborist Association, P.O. Box 1094, Amherst, NH 03031-1094 · Phone: 1-800-733-2622

OR

The International Society of Arboriculture, P.O. Box GG, Savoy, IL 61874-9902 · Phone: 1-217-355-9411; FAX: 1-217-355-9516.

FAX: 1-603-672-2613
September 4-6, 1997
McCullough's Tree Care/
Western Chapter, ISA
Sustainable Tree Care Conference
University of California, Los Angeles,
Contact: 818-448-425

September 5-7, 1997
Paul Smith's College
"Touching Trees" with Dr. Alex Shigo
Paul Smiths, New York
Contact: Mike Rechlin, 518-327-6236

September 10, 1997
Michigan Forestry and Parks Assoc., Inc.
Tree Climbers' Jamboree
Southfield, Michigan
Contact: Dale Thompson, 517-374-2305

September 10-11, 1997
Michigan Chapter, ISA
Educational Summer Conference 1997
Southfield, Michigan
Contact: 517-482-5530

September 16-17, 1997
Mendocino ReLeaf
"Tree Science for Better Tree Care"
Dr. Alex Shigo
Santa Rosa, California
Contact: John Phillips, 707-459-3015

September 16-18, 1997
Mt. Lake Vegetation Mgmt. Council
43rd Annual Meeting
Valley Forge Hilton, Valley Forge, Penn.
Contact: Dave Krause, 717-766-6661

September 17, 1997
Landscape Contractors Association
LCA's Annual SuperShow
West Friendship, Maryland
Contact: 301-948-0810

September 17-20, 1997
American Forests
Cities by Nature's Design
Hyatt Regency, Atlanta, Georgia
Contact: 202-667-3300

September 18, 1997
California Arborists Assoc.
Fall Pest Management Seminar
Union City, California
Contact: Richard Sealana, 510-487-9264

October 1-3, 1997
Pacific Northwest Chapter, ISA
"Getting to the Root of Professional Tree Care"
Annual Training Conference
Whistler, British Columbia
Contact: PNW-ISA, 206-784-1945

October 3, 1997
Mid-Atlantic Chapter, ISA
"Trees, Shrubs and Habitat"
Tuscan, Arizona
Contact: D. Marburger, 520-792-4669

October 5-7, 1997
Landscape Contractors Association
LCA's Annual SuperShow
West Friendship, Maryland
Contact: 301-948-0810

October 5-8, 1997
Mid-Atlantic Chapter, ISA
"Set Your Sights on Arboriculture"
Annual Meeting and Trade Show
Hagerstown, Maryland
Contact: Don Blair, 301-842-2544

October 10-11, 1997
Michigan Arborists Assoc.
Fall Pest Management Seminar
Union City, California
Contact: Richard Sealana, 510-487-9264

October 15-18, 1997
Mid-Atlantic Chapter, ISA
"Set Your Sights on Arboriculture"
Annual Meeting and Trade Show
Hagerstown, Maryland
Contact: Don Blair, 301-842-2544

October 15-18, 1997
American Society of Consulting Arborists
30th Annual Conference
Coronado Springs Resort
Orlando, Florida
Contact: ASCA at 301-947-0483

October 23-24, 1997
Florida Chapter, ISA
Annual Conference: "Florida Arboriculture: Establishing New Roots"
Orlando, Florida
Contact: Fax: 941-379-7425

October 24-26, 1997
New Jersey Shade Tree Federation
72nd Annual Meeting and Tree Expo
Atlantic City West Hotel
Pleasantville, New Jersey
Contact: 908-246-3210

November 2-5, 1997
National Institute on Park and Grounds Management
"The Art of Being Exceptional"
Annual Education Conference
Westin Galleria
Houston, Texas
Contact: 414-733-2301

November 6-8, 1997
TCI EXPO '97
Columbus Convention Center
Columbus, Ohio
Contact: 800-733-2622

November 15-18, 1997
Professional Lawn Care Association of America
18th Annual Lawn & Landscape Conf.
Charlotte Convention Center
Charlotte, North Carolina
Contact: 800-458-3466

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Flying to TCI EXPO?

All of us fail to heed the warning of the old adage... *don't put off until tomorrow what you can do today*. This time, however, procrastination may be to your advantage.

NAA has negotiated special discounts with the airline carriers listed below for travel to TCI EXPO '97 in Columbus, Ohio. These special discounts include savings off the lowest published fares and reduced-rate, zone fares that do not require a Saturday night stay. Whether you are attending TCI EXPO for 1 day or 3 days, following the directions below will ensure you will receive the best possible price on your airline ticket.

**Travel Worldwide Network**

For the best travel rates to Columbus, please contact our travel experts at Travel Worldwide Network at 1-800-631-9675. Remember to identify yourself as an attendee of the NAA/TCI EXPO. Travel Worldwide Network is open Monday - Friday, 8:30 a.m. - 5:00 p.m. EDT.

**US Airways**

To make your reservation, call US Airways' Meeting and Convention Reservation Center at 1-800-334-8644 and reference the National Arborist Association's Gold File Number 19260026.

**Delta Airlines**

To obtain the special discount fare, call Delta's Meeting Reservations line at 1-800-241-6760 and refer to the National Arborist Association's File Number XY193.

If you prefer to use your own travel agency, simply ask them to call the appropriate airline carrier for the specific pricing offer filed with the above Reference Number.

Whether this is your first time attending TCI EXPO or you're a seasoned veteran, don't be left at the gate.
Excellence: the property of being excellent, eminently good

Excellence in Arboriculture Awards have been introduced by the National Arborist Association to the tree care industry to recognize all clients and companies who, through their constant dedication and commitment towards industry and work have done something that is a benchmark for how work should be done. The Excellence Awards were created with the sole purpose of uplifting the confidence of tree care companies and acknowledging that, "Yes, this is how work is to be done, and you did a great job."

These awards build a stronger relationship with NAA members' clients, as the clients feel that some of the finest works done in the tree care industry was done on their property.

"This is the best way to be rewarded for a lot of time and effort put into the project. A worthwhile recognition," says Gary Rohrbach of Gary’s Tree and Shrubbery Service, winner of the 1996 Award of Distinction. The Excellence in Arboriculture Awards has been elected to the Honor Roll in the Associations Advance America Awards program.

The award shines a spotlight on your work, promotes your business in the community and increases employee morale. "Winning the NAA Excellence in Arboriculture Award has been a terrific boost for all of our staff members who made it possible," adds Daniel Van Starrenburg of SavATree, winner of the 1996 Heritage Award. We use it to toot our horn at every opportunity we get."

This award enhances a company's reputation as first-rate arborists and a customer's belief in the firm's level expertise is reinforced. Feature articles are published in Tree Care Industry magazine on the Grand Award, Arbor Day Award and the Heritage Award winners, and local media recognize the achievement of winners in their area.

The awards are presented at the NAA Winter Management Conference Awards Banquet, sponsored by Altec Industries and a unique, attractive wall plaque displaying the award is presented. "The award helped our employees understand the true value of work and increased public awareness to differentiate between professional and non-professional arboriculture in the community," says William E. deVos of Treeworks, Ltd., winner of the 1996 Award of Distinction.

The awards are open for NAA member companies only. If you are a non-member company who thinks that this is the type of recognition you deserve, call the NAA at 800-733-2622 for membership and awards information. The NAA is offering membership from September 1997 to the end of 1998 for the cost of a single year's membership. So, pick up your camera and take some before-and-after picture's of your best projects. It is time that you and your company received the appreciation you deserve.

Shigo, Keynote Speaker at TCI EXPO '97

Due to unforeseen circumstances, seminars previously scheduled to be presented by Dr. Claus Mattheck at TCI EXPO '97 will not occur.

We are pleased to welcome Dr. Alex Shigo, noted author, lecturer and owner of Shigo & Trees, Associates, who will address the audience with keynote presentation titled "Tree Chemistry for Fun and Profit." (See TCI EXPO '97 brochure in this issue for more information.)
STUMP CUTTERS

Model 2500-4
• 25 HP Kohler Command Engine • Stable Four Wheel Stance • Complete Hydraulic Control Including Steering & Propulsion • Compact 35" Width Fits Easily Through Gates • 1" Thick Cutter Wheel • Self Purging Roller Bearings For Long Life

Model 3500
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Model 4400-D
• 43 HP Deutz Diesel • Big Cutting Power in a Mid-Size Machine • Optional Remote Control Available

Model 7500
• 75 HP Four Cylinder Turbo-Charged Deutz Diesel Engine • Massive 1 1/2" Thick 34" Diameter Cutter Wheel With 48 Teeth • Unmatched Cutting Dimensions

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What's different about our new chipper? EVERYTHING!

The Model 911 is the first in a line of chippers to be introduced by Doskocil Industries, Inc. Many of the patent pending features on the Model 911 are a direct result of suggestions and ideas from professional arborists like yourself. We at Doskocil Industries are dedicated to design and manufacture quality equipment for your needs.

Dosko turns exclusively to Key Knife for their state-of-the-art Chipper Knife System. The key knives are precisely positioned in place assuring accurate knife point location with no adjustments required. Installing new knives or reversing worn knives can be done in minutes even on the job site.

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

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Isn't it time you took hold of your career and your future? Call us toll free today for more information about Tree Care Specialist or any of the training materials available from the National Arborist Association.

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Fax: 603-672-2613
E-Mail: 76142.463@compuserve.com

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HELP WANTED

The Pacific Northwest Chapter of the International Society of Arboriculture, encompassing Oregon, Washington, Idaho, British Columbia, and Alaska seeks an Executive Director. The successful candidate will work closely with the Board and help the Chapter to develop and expand its organization into the next century. The salary package of between US$35,000 to US$45,000 will have incentives to be negotiated. All applications must be postmarked no later than September 15th, 1997. Fax or emailed applications will not be accepted. Interested applicants may obtain an application package from Julian A. Dunster, P.O. Box 109, Bowen Island, B.C., Canada VON 1GO; or Terrill Collier, 9032 S.E. Division, Portland, OR 97266-1449, phone: 503-774-9642; or ISA Pacific NW Chapter, P.O. Box 30713, Seattle, WA 98103, phone: 206-784-1945; or by downloading it at http://www.teleport.com/-pnwisa.

Experienced foreman/climber needed for growing northern Virginia tree service. Great pay and benefits for qualified people. Call VTM Arborists at 703-818-9484 of fax resume to 703-818-3110.


Swingle Tree, a Denver Tradition since 1947 with state of the art facility and equipment is seeking plant health care manager and supervisors w/2-4 yr related degree and min 3-5 yrs experience in ornamental insect diagnosis/recommendations. Excellent communication skills w/ability to train and supervise production crews required, as is ability to route efficiently. Responsibilities include staffing, scheduling, budget control, customer service and quality control, product evaluation/selection. $30-$50K (sal + bonus), DOE. For immediate confidential consideration, please send or fax your resume to Swingle Tree Company, 8585 E. Warren Ave, Denver, CO 80231 ATTN: Catherine. Fax: 303-337-0157.

Salesman/Foreman for fertilizer and spray accounts. Small company, large customer base—3,000 to 4,000 to be marketed. For more information, contact Holbrook Tree Service, 252 Union Street, Yarmouthport, MA 02675. Phone: 508-362-8058.

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TREE CARE INDUSTRY - SEPTEMBER 1997
Arborist 4 Sales.
Econo Tree Service, is an established San Francisco Peninsula full service tree care company seeking an experienced and fully qualified arborist with good sales skills to market an established territory. The person needs to be a self-starter and a highly motivated team player. Candidates must be committed to the highest standards of professionalism, and understand the importance of a safe and friendly environment with good salary/benefits. Send your resume to: Beverly Strom, The Care of Trees, 2371 S. Foster Avenue, Wheeling, IL 60090. Phone: (847)394-1596. EOE

Experience growth with us. We are a full service tree care company that is willing to train individuals in general tree care. We have openings for general tree care, climbing, PHC, and sales positions throughout the metro areas of Chicago, Connecticut, New York, New Jersey, Virginia, Maryland, and Washington, D.C. We offer training and advancement potential for individuals that are willing to put forth extra effort to help themselves and the company succeed. Our company offers excellent benefits and competitive wages. Please call or send your resume to: Beverly Strom, The Care of Trees, 2371 S. Foster Avenue, Wheeling, IL 60090. Phone: (847)394-1596. EOE

Plant Health Care, Climbing Arborist.
Sales. Boston area company of professional arborists has leadership and crew positions available for outstanding individual(s) w/ min. 2 yrs. exp. Candidates must be committed to highest industry standards of safety, workmanship & customer service. Exc. wage & benefit package, including pension (401k), medical & more. Send resume to: Lueders, PO Box 279, Needham, MA 02192 or call 508-359-9905.

FLORAPersonnel INC. In our second decade of performing confidential key employee searches for the landscape/tree industry and allied trades worldwide. Retained basis only. Candidate contact welcome, confidential, and always free. 1740 Lake Markham Rd., Sanford FL 32771. Phone (407) 320-8177. Fax (407) 320-8083.

Come grow with us. We are a full service tree care company that is willing to train individuals in general tree care. We have openings for general tree care, climbing, PHC, and sales positions throughout the metro areas of Chicago, Connecticut, New York, New Jersey, Virginia, Maryland, and Washington, D.C. We offer training and advancement potential for individuals that are willing to put forth extra effort to help themselves and the company succeed. Our company offers excellent benefits and competitive wages. Please call or send your resume to: Beverly Strom, The Care of Trees, 2371 S. Foster Avenue, Wheeling, IL 60090. Phone: (847)394-1596. EOE

Almeast, Inc. - Our continuous expansion leads us in the pursuit of career-oriented professionals in the tree care industry. Supported by a 32-year reputation for total quality, we truly stimulate growth potential in a team atmosphere. The following positions in utility and residential arboriculture are available in the Northeast. All positions offer an excellent compensation package. Sales Representative • Tree Care Foreman • PHC Technician • Utility Supervisor. Forward resume to Human Resources, 58 Beechwood Ave, New Rochelle, NY 10801, or fax to 914-576-5448.

Ocean Crown Environmental, Inc., an expanding company in tree care services has an immediate opening for a Certified Arborist. Excellent wages and benefits with opportunity for advancement. Please call Larry at (305) 770-4441 or send resume to Ocean Crown Environmental, Inc., P.O. Box 693189, Miami, Florida 33269.

Come to Florida and join a quality company. The largest in North Florida, Big Ben's Tree Service is located in Jax., FL, is currently in need of a climber/supervisor with a CDL license (class B). We offer excellent wages and opportunities for advancement. Interested? Please call 904-641-1131.

Guardian Tree Experts, Inc., seeks a motivated tree care professional to work year-round 7:30-5:00 Monday-Friday as a Tree Trimmer in our Northern Virginia or Rockville, Maryland office. We have served in the D.C. Metropolitan area since 1961. Excellent pay and benefits package, including a 401(k) retirement program, paid holidays, sick leave and vacation, bonuses, group health and disability insurance plan. Applicant should be willing to work towards becoming ISA certified tree climber or certified arborist, a CDL holder and CPR-First Aid certified. To join our team of safe-working professionals please call: (703)256-3291.

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FOR SALE

Used Equipment for Sale. (1) 1988 Asplundh 16JEY drum chipper, Ford Industrial 6 cylinder, good mechanical condition, just painted; (1) 1986 Vermeer 1600 drum chipper, Ford Industrial 6 cylinder replaced in 1991, good shape. $6000 each or best offer. 901-377-8733 days or 901-755-8766 after 6 p.m.


For Sale: Vermeer stump grinder model 665 A, runs great, has new pro-series teeth. Asking $8,000 obo. Also, a chipper with a 12 inch drum newly rebuilt with new blades for $4,000 obo. Call: 219-269-9331, Indiana.


International 1900, 5 speed transmission, 2 speed axle, Cat 3208 diesel, new paint, Asplundh LR50 aerial lift (working height 55 feet), flat deck, 2 large tool boxes, cab guard, asking price $18,900 US funds, $25,900 Canadian funds. Call 519-945-4385 or 519-969-5451 after 6 p.m.

Used Equipment for Sale. (1) 1988 Asplundh 16JEY drum chipper, Ford Industrial 6 cylinder, good mechanical condition, just painted; (1) 1986 Vermeer 1600 drum chipper, Ford Industrial 6 cylinder replaced in 1991, good shape. $6000 each or best offer. 901-377-8733 days or 901-755-8766 after 6 p.m.


For Sale: Vermeer stump grinder model 665 A, runs great, has new pro-series teeth. Asking $8,000 obo. Also, a chipper with a 12 inch drum newly rebuilt with new blades for $4,000 obo. Call: 219-269-9331, Indiana.
1989 Ford F-800 4x4 7.8, 6 cyl diesel, 240 HP, 6 speed transmission with Altec AM550H bucket, material handler, 2000 lb. capacity, overcenter cap, truck winch, low miles, very clean, excellent condition - $48,000. 1996 S&D tandem axle utility trailer, new $3800. Call Tom at 716-657-6975.

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**TREE SPADES for sale:** 32 inch Rokor, 44 inch Vermeer, 60 inch Big John, 88 inch Big John, for sale or trade. 500 44 inch Braun baskets. **Make offer!** Phone: (504)892-0023.


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As the green industry becomes more and more on-line, we want to make sure our readers are ready to surf the wave when it comes their way. Use this list to have some fun and find out more about products, services, and happenings on the Internet. This month we highlight the home page of the J.J. Mauget Company on the World Wide Web.

Visiting the Mauget site is an experience in a “virtual drugstore.” The user is greeted with a colorful list of links to all of Mauget’s microinjection products. The company devotes a separate page to fertilizers, insecticides, fungicides and antibiotics, and the user can scroll down each hearty list of products to find the one that best suits his needs. A link to Mauget’s distributors and their Web sites sends the user in the right direction. Other pages of interest on this site include:

- an animated description of the microinjection process
- the history of microinjection
- microinjection chemical combinations
- research and training in the microinjection industry

Some of these pages are currently under construction but should prove informative when they are finally up on the company’s server.

The site also features links to Mauget’s coolest ads, all of which have appeared in TCI magazine: one about Mauget on Earth Day, and a microinjection cartoon along the lines of “This is your brain on drugs...” commercial showing a bug on Mauget insecticides. The most impressive feature of this site is the sidebar frame of links that stays stuck to the screen as the user moves through the site allowing him to go to any link anytime he chooses. And, the user may return to the Mauget site with a click of the mouse. Check out Mauget at www.mauget.com.
November 6 – 8, 1997 • Columbus, Ohio
Call 1-800-733-2622 for more information.

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General Interest

GardenNet
http://www.olympus.net/gardens/welcome.html

Ohio Division of Forestry
http://hortwww-ag.ohio-state.edu/ODNR/Forestry.htm.

Chamber of Commerce
http://www.uschamber.org

Occupational Safety and Health Admin.
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Make it Your Business to Know

Sponsored by The Bishop Company for the advancement of our industry.

Today's tree care industry is experiencing tremendous technological development. There is a growing awareness of the innovative techniques and equipment being introduced to our profession as arborists worldwide seek new ways to meet the challenges of working in the urban forest. It can be very challenging and, at times, confusing when making decisions about how, when and where to spend our time and money implementing change. After all, change simply for the sake of change is not always safe or productive.

So how do we make effective decisions regarding implementation of new tools and techniques? The criteria that I use is as follows: does this new tool or technique really have the ability to make my work safer, easier and more efficient? If all three criteria are met, then I will commit myself not only financially but also to the learning curve that will be involved.

Once a decision is made to apply a new tool or technique, it is more important than ever that we become thoroughly informed. It is important to choose suppliers and manufacturers that, first and foremost, strive to provide safe equipment that is well-designed and up to date. Comfort, weight and versatility are also very important features to consider.

As with all developing technology, it is important for Arborist suppliers and manufacturers to understand the true nature of our working environments. We must share the responsibility by staying informed, developing a commitment to safety and training and complying with industry standards.

For example, The FrictionSaver is a false crotch designed to be used for climbing, not for rigging operations. It consists of two differently sized aircraft aluminum rings, connected with one length of nylon webbing. The webbing is multi-layered by wrapping and sewing in such a way as to loosely capture the rings to allow thorough inspection of wear points.

The FrictionSaver is placed in a secure crotch or wrapped around a secure limb. The climbing line is then run through the rings instead of a natural crotch. This reduces abrasion on the tree, rope wear and climber fatigue.

The difference in the ring size permits a knot near the end of the rope to pass through the larger ring, but not through the smaller ring. This allows the device to be removed without revisiting the tie-in point.

There are many stories about arborist who received broken teeth or stitches while dislodging a steel snap from below. Aluminum is far more forgiving in this respect, however the potential of injury still exists. Hardware should never be thrown from a tree or slammed to the ground in any way. This type of abuse can lead to fracture and failure.

The FrictionSaver can also be installed in the tree and made ready for use without visiting the tie-in point. It can be safely removed from the tree and lowered to the ground by simply attaching a throw line string below the knot (or key).

The smaller ring should not be able to pass through the larger ring. This can complicate both installation and removal and greatly increase the likelihood of misuse as some type of choker sling! The rings must be able to rotate for even wear. Their symmetry allows heat to dissipate evenly, reducing the potential of damage to climbing lines. High-grade aircraft aluminum is strong, lightweight and durable. Though steel may tolerate more abuse, aluminum dissipates heat more efficiently than steel, and it is lighter.

Unlike the sheave of a pulley, the rings do not rotate with the rope as it passes through the device. Therefore, note that the FrictionSaver is then unable to reduce the friction and dissipate the heat that can be generated during rigging operations!

Always inspect equipment thoroughly before each use. “When in doubt, throw it out!” Make it your business to know the design specifications and the limitations associated with any application.

When manufactured and used properly, the FrictionSaver is a tool that makes tree climbing safer, easier and more efficient. Remember, climb safe! I’ll see you at the top!

Ken Palmer
President, ArborMaster Training, Inc.

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Friction Saver
Safer, Easier To Use & More Efficient

The Friction Saver/False Crotch provides reduced, more consistent friction on the climbing line and at the same time minimizes damage to the tree from the rope.

Buckingham’s Friction Saver brings you quality, versatility and reliability. Work with the best for your own safety.

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Friction Saver comes with a complete written and illustrated visual installation guide.

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Ozone Alert

Recognize the warning signs of ozone damage

High levels of ozone caused upper surface purple leaf stipple on this yellow poplar.

Tip burn injury on an eastern white pine.

Over long distances, so trees in regions far from metropolitan areas may suffer as well. Already in southern California, entire populations of Ponderosa pine have been wiped out in the San Bernadino Mountains due to chronic ozone exposure. Surviving tree populations are made up exclusively of ozone-tolerant species.

The pollutant forms a super-molecule called an oxyradical that acts as an oxidant, disrupting chemical pathways throughout the plant cell. In response, the tree manufactures additional antioxidants like vitamin E and C. Struggling to break up the oxyradical, the tree increases levels of an enzyme called super-oxide dismutase. These defenses may offer relief from low levels of ozone, yet are no match for repeated exposure to toxic levels.

Dr. Boris Chevone, also a plant physiologist at VPI, explains that ozone injury looks different on different species. On the leaves of poplar and black cherry, arborists may see dark brown or black lesions. On ash, however, the lesions are white. On other species, damage appears as a purple stippling all over the leaf. Evergreens suffer tip-burn.

Ozone damage may simply affect leaves as described above, or it may be far worse, affecting normal growth and development of a tree. “Depending on how much you affect photosynthesis, you might not even get reproduction,” warns Alscher.

The best thing arborists can do to protect trees from ozone injury is keep them in a healthy state. This includes protecting trees from wounding, and keeping them well watered and judiciously fertilized. Planting resistant varieties around homes where the potential for ozone damage is high will offer relief, as well. Refer to the table on ozone-sensitive and tolerant species for more information.
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The rear mount is so compact, this vehicle can maneuver with ease through tight spaces and give additional working height.

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- And much, much more!

Approximately 26'

84" CA.

Very compact with a short wheel base of 132". Back of the cab to center of the rear axle dimension is 84".

The staff of Aerial Lift has extensive experience since 1958 in research, engineering and design of aerial devices. We have an engineering staff member on the ANSI/SIA A92.2, subcommittee to issue the reliability, quality and safety of all aerial lifts, that a common goal of safer, more efficient aerial devices is upheld. Aerial Lift is constantly striving to provide our customers with the latest in aerial devices and the best service in the industry. It is our relentless effort in pursuit of these goals that assures our customers maximized operating economies.

The rear mount is so compact, this vehicle can maneuver with ease through tight spaces and give additional working height.

Approximately 26'

All parts on an Aerial Lift are available for overnight delivery.

50 foot side reach work can be performed without leaving the roadway.

See us at TCI EXPO '97!

From trimming to removals, you gain the extra height by working over the rear of the truck, enabling you to set up in smaller and tighter areas.

These 55', 58' and 60 foot working height vehicles are the most compact and maneuverable for doing (GTW) General Tree Work. The overall length of the unit is approximately 26 feet.

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TCI EXPO '97

It's Your Kind of Show

Registration/Schedule for TCI EXPO '97
November 6 – 8, 1997, Columbus, Ohio
Welcome to Columbus

and the 8th Annual Tree Care Industry Exposition!

Presented by the National Arborist Association,
Inc. and the International Society of
Arboriculture

Thank you to Barbee Tree Company, Inc.
for this year's Demo tree donation.

Why should you attend?
The sky is the limit with what you will learn from this
year's exciting and educational program . . .

- Over 150 exhibitors under one roof, bringing you cutting-edge tree care technology, products and
  services.
- Live demonstrations of climbing, rigging, aerial rescue and cabling and bracing.
- The SMART MANAGER and EXPERT PRACTITIONER seminar series allow you to customize
  your educational experience to fit your needs - with several sessions offering pesticide applicator
  recertification credits and ISA continuing education units.
- Admission to the trade show is FREE! Registration is required to obtain your admission badge.
  Be sure to pre-register and avoid long lines at the registration area.
- Take advantage of the educational seminars. SAVE! SAVE! SAVE! Register before the Early Bird
  deadline of October 17 to receive your discounts. Save, Save, Save. . . Bring additional co-workers
  from your company and save on each registration.

Please Note: We encourage you to bring all of your employees to TCI EXPO '97. TCI EXPO is a valuable educational experience. Exhibitors are not permitted to recruit employees on the trade show floor.
The products and services you need to achieve success with your tree care company are all under one roof. Attend TCI EXPO '97 and make a difference in your future!

ACRT, Inc.
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The Davey Tree Expert Company
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The Doggett Corporation
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Engine Distributors, Inc.
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Plastic Composites Corporation
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Power Great Lakes Inc.
Practical Solutions, Inc.
Preformed Line Products
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Safety Test & Equipment Company
Salsco Inc.
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Service Communications Software
Shelter Tree, Inc./Tree Care Products
Sherrill Inc.
Shindaiwa, Inc.
Sierra Moreno Mercantile Company
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Southco Industries, Inc.
Southeastern Equipment Company
STIHL
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Tamarack Clearing, Inc.
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Time Manufacturing Company
TrafFix Devices, Inc.
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Tree Management Systems, Inc.
Tree Moving Network (TMN)
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
Westheffer Company, Inc.
Wis-Con Total Power Corporation
Wood/Chuck Chipper Corporation
Wood-Mizer Products, Inc.
Yale Cordage, Inc.
Zenith Cutter Company
Schedule of Events

Thursday, November 6, 1997

7:30 am  REGISTRATION OPENS

Complimentary coffee available

8:00 am  WELCOME TO TCI EXPO - Dick Proudfoot

8:15 to 9:45 am  KEYNOTE ADDRESS:  
TREE CHEMISTRY FOR FUN AND PROFIT - Dr. Alex Shigo

Every time you fertilize, water or prune a tree, every time you apply pesticides, you are using chemicals or affecting the chemistry of the tree. Chemistry weaves a web through much of what we do, so to become more professional and effective, we must at least have an awareness of the chemical world.

Increasing our awareness about how life works with chemistry puts us in the driver’s seat about selection and use of products on the market. Understanding chemistry will also help you in dealing with the restrictions placed on their use, and communicating with the client who is chemistry and chemical-frightened.

With workshops and a forthcoming book on the subject to his credit, who better to take the fear out of and put the FUN into chemistry for arborists than Dr. Alex Shigo.

9:57 am  TRADE SHOW OPENS

Don’t miss a single booth! 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 here.

Plus, we’ve arranged for plenty of exciting demonstrations ranging from climbing and rigging to cabling and bracing. 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 - Demo Area

Be sure to fill out your entry form and you could be the winner of 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!

2:00 pm  ARBORBUCKS DRAWING - Demo Area

It’s not too late to enter the drawing. You could be the winner!

4:00 to 5:00 pm  DISCOVERING A NEW WORLD:  
THE FUTURE OF TRAINING AND INFORMATION DISSEMINATION IN TREE CARE - Albin P. Dearing

The challenge of providing information and training to a diversified workforce spread across the United States has led Davey Resource Group to incorporating multimedia, online interaction, digitized material, the Web, interactive CD’s and 3-D animation to their repertoire, with the speaker as one of the principal architects. Even if you’re a small to medium-size company, you will find that the communications technology of tomorrow is surprisingly applicable to your needs and within your budget.

5:00 pm  TRADE SHOW CLOSES

5:15 to 6:00 pm  BECOMING A BETTER PHOTOGRAPHER - 
Sarah Bones

This Session is FREE for NAA Members and their invited guests. Whether its for putting together a winning Excellence in Arboriculture entry, creating a portfolio of your work to sell a prospect on your company, for consulting, or simply for documenting your work, good photography can be a real asset. Sarah Bones is a commercial photographer with extensive experience in nature photography. For the past four years she has handled the prodigious task of capturing TCI EXPO on film. Coincidentally, she is married to an arborist, so she understands and can explain the importance of good photography to your business.

6:00 to 8:00 pm  WELCOME RECEPTION FOR ALL ATTENDEES AND EXHIBITORS

Regency Ballroom, Hyatt Regency Columbus

Complimentary hors d’oeuvres, beer, wine, and soda.

Visit with old friends, make new ones, network, and enjoy an evening of fun with fellow tree care professionals.

Friday, November 7, 1997

7:30 am  REGISTRATION OPENS

Complimentary coffee available

8:00 to 9:00 am  HOST/PEST PHENOLOGY and USE OF BIOLOGICALS/BIORATIONALS IN INSECT PEST MANAGEMENT - Dr. Dan Herms

Twenty-first Century tree and ornamental pest management is a numbers game with variables like degree days, pest thresholds, predator thresholds and pesticide residuals. With a distinguished career in Michigan and Ohio, Dr. Herms will use familiar host/pest associates to help you become a more knowledgeable, effective pest management specialist.

8:00 to 9:00 am  TEAM BUILDING - Kevin Kehoe

A major reason that otherwise capable people fail to advance, and therefore the reason their employers fail to capitalize fully from employee growth, is that they fail to understand how to work well with their colleagues. The solution? Team building. Kehoe, an expert in this area, is the principal of Kevin Kehoe & Company, a management consulting firm with a long and successful relationship with the Green Industry.