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*stimulation of fibrous roots has been seen in oaks, elms, maples, and lindens. Other species need more research.

photo courtesy Gary Watson, Morton Arboretum

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What Have You Done For Yourself Lately?

If you’re in Florida, the balmy breezes of summer have fully arrived, the beach sand is warm, and the drinks are filled with ice. If you’re in the Northeast, as I write this in May, we’re just hopeful that there won’t be any snow in June or July, since there was some last couple days ago. It’s supposed to be that time of year that once was described as those “lazy days of summer.” Where I grew up, one’s mind drifts to shady front porches, ceiling fans, iced tea or lemonade, a slow afternoon, and a good book to confront the humidity of the day. Camping by a cool river or swimming in a local lake were other wonderful options. Just thinking about those activities, a feeling of peace, rejuvenation, and enjoying life comes over me.

It just so happens for this industry that summer is high noon for us. We rush through the day from job to job, pushing those productivity hours, keeping equipment fixed, and hoping to keep all of our staff. The backlog of work is not quite what we hoped it would be this year, and the sales push is a little harder for everybody. In the middle of all this high-strung activity, the kids are still out of school. The beach is still resting there with waves lapping the shoreline second by second. The cool of the mountains, with their rivers, waterfalls, lakes and peace, beckon.

So what have you done for yourself lately? What has your family stopped and done together? When are you scheduling your family vacation? What about your employees? Do they get any time off to be with their families when the kids are out of school? Do you limit them to only taking one week off at a time – never two weeks together?

You’ve met folks who with great and utter pride say they have not taken a vacation day in five years. It’s a badge of honor ... something we’re supposed to look up to. I often wonder what would happen if one of those indispensable folks had to miss work for a few weeks or months? Have they kept all the knowledge to themselves, so that nobody could possibly do their job well? Have their auditors never mentioned that anyone working with the money should have one full week of vacation off every year for the sake of internal controls? Have they honestly positioned themselves as indispensable, thinking that would be a good thing for the business?

When my husband arrived 16 years ago from Europe, he left five weeks of paid vacation plus public holidays behind. He was completely stupefied by a thought process that permeates American business. It goes something like this, “An employee at work every day is someone from whom maximum productivity is being gained. An employee not at work is of no value to me.” Consider this, “An employee who is refreshed, rejuvenated, and has a well-rounded life will add more value to my business, will have fewer accidents, and is more likely to stay with me.” As Anna Quindlen wrote in A Short Guide to a Happy Life, “You cannot be really first-rate at your work if your work is all you are.”

So think about it a bit ... what have you done for yourself lately? And are you encouraging your employees to do something for themselves too?

Here’s to a few lazy days this summer!

Cynthia Mills, CAE
Publisher
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This planting hole leaves plenty of space for the tree's roots to grow into.

Photo courtesy Dr. Bonnie Appleton.

This dying London Plane put out adventitious roots above its original roots in an effort to survive. Photo courtesy Dr. Bonnie Appleton.

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Tree Planting Guidelines

By Dr. Bonnie Appleton

Wouldn’t it be nice if arborists could have input before being called in to keep the wrong tree alive in the wrong location? If arborists could get in before the damage was done and suggest how to prevent it, we could start to overcome the epidemic of damage that begins at planting.

As arborists, we often come across boilerplate planting specifications with parts that we wish we could change. I prefer to provide people with the basics and then suggest how they can enhance survivability depending on each planting situation, time of year, and species of tree. It gets complicated, but the ideal would be specific planting instructions for each specific situation.

Unfortunately, the primary factor today in selecting plants is aesthetics. Further down on the list are size, maintenance and environmental factors. I would like the industry and the public to come to the awareness that the priorities should be changed. I would recommend that environmental considerations be first, followed by size, maintenance and aesthetics.

Here’s my planting checklist:

Landscape plant selection
Considerations
Select the right tree for the right location following these considerations.

Environmental (pre vs. post construction)
- Soil – type, uniformity, depth, debris and contaminants, aeration, compaction, subsurface hardpans, pH, salinity, water and nutrient holding capacity
- Water – soil (quantity, quality), precipitation, irrigation (quantity, quality), runoff
- Light – intensity, duration
- Temperature – cold vs. heat tolerance/hardiness (stem vs. roots; 2 zone maps); macro- vs. microclimates, provenance
- Air – movement and velocity (wind), gaseous and particulate materials
- Topography – elevation, slope
- Existing vegetation – root/canopy competition, allelopathy, indicator species

Size
- Above ground – height, spread
- Below ground – root system spread vs. soil volume
- Growth rate vs. longevity
- Effects of environmental conditions – design compromises

Installation and Maintenance
- Regulations
- Transplantability
- Site preparation/modification

• Pest management
• Structural management (pruning, lightning protection, etc.)
• Irrigation
• Litter
• Hazard potential
• Vandalism potential/people pressure
• Use of chemicals

Miscellaneous
- Cost, availability
- Native vs. naturalized vs. non-native/exotic/introduced/alien – invasive potential
- Wildlife attraction
- Flammability
- Monocultures – “Dr. Santamour’s rule” – No more than 10 percent of any one species; no more than 20 percent of any one genus; and no more than 30 percent of any one family.
Nursery production

Another big consideration prior to installation is how the tree was grown at the nursery. Was it grown in a container, the field, or both?

We now have 600-gallon containers in use in the nursery industry. Even big trees may now come from container production vs. field production—especially further south. With containers, the primary concern is to check for a malformed (circling, matted) root system. Through physical means such as air root pruning and chemical coatings (copper), we can modify roots so that they are more fibrous.

To have less matting and circling, modify the roots before backfilling. That way the roots will have a chance to get out into the backfill. People can’t understand how a field-grown tree can have a tight, circling root system. It probably started in a container, and nobody modified that root system when the tree went out into the nursery’s field. The only way to check for circling roots is to excavate some of the soil around the flare area and look for them.

In dealing with field-grown trees, find out how they were stored prior to transplant. If they are freshly dug, roots should be in good condition. Many trees, however, will be held at the nursery or wholesaler (or on the planting site) for weeks or months. Root balls begin to dry out, harden and pancake. A variety of things begin to happen the longer a root ball is out of the ground, and the quality of the root system begins to go downhill. No matter how well that plant is installed, if there isn’t a viable root system, it won’t re-establish.

Soil considerations

Once arborists have picked the right tree for the right location and checked to see how the tree was grown, the next concern is the soil into which the tree will be planted.

We are seeing a major loss of trees because people are not aware of drainage at the planting site. I recommend this very simple test: Dig a hole and fill it with water. Watch how long it takes for the water to drain away. If the water doesn’t drain at the rate of one inch an hour, then there is probably a drainage problem. The site can be modified prior to planting the tree or a different species of tree can be selected. If the soil doesn’t drain well, that dogwood you were thinking of planting will drown very quickly.

If you discover a drainage problem, perhaps you can create a berm, change the landscape’s design or change species. If you find that you have poorly drained soil and you can’t create a berm, dig a hole to the proper planting depth. Then, dig deeper around where the root ball will sit to create a soil pedestal where water can temporarily drain.

Let’s look closely at the specifications. I wrote a book several years ago called Landscape Rejuvenation, and I put a composite in it that I thought represented every bad part of the planting process.
Examples are:
- Holes that were too narrow;
- Holes that were too deep;
- Gravel in the bottom of the hole;
- No burlap removal;
- No balling ropes or tops of wire baskets removal;
- Rigid tree staking, which should be a site-by-site decision.

The planting hole

Eighty percent to 98 percent of a field-grown tree's absorbing root surface may be left behind at the nursery when the tree is dug. We do not leave the bulk of the weight or the stored sugar of that tree, however, which is what will fuel new root growth to replace all those roots that were cut off. No wonder most of our balled and burlap

This was a demonstration looking at how quickly roots could get out and different holding methods. After five months, this was all of the root system that managed to get out of untreated burlap. There isn't enough root system to sustain the plant under stressful conditions.

Most of the time, it isn't possible to unwrap the root ball completely. This was a small tree that was not in a wire basket. In this case, just cut the ropes, pull the nails and drop the burlap. Don't worry about getting it out of the planting hole. It is at the bottom of the hole and roots grow out laterally. The top inches are where the bulk of absorbing roots will grow out of.

We see this time and time again. A contributing factor to the decline of the tree was roots that were girdling in wire baskets.

---

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trees manage to survive (if they are given any type of decent follow-up care). They are transplanted with the reserves they need to produce new roots.

It is different with a container-grown tree, which has 100 percent of both the reserves and the absorbing root system. There is something to be said for trees produced in larger and larger containers. A big tree grown in a container does not have lag time for root replacement. Unfortunately, there may be a problem with the soil substrate mix used during production due to soil interfaces that may be created.

Container-grown plants are often grown in substrates totally without soil. As a result, some people shake or tease out the substrate down to partially bare root before planting. It may be difficult to shake substrate out of a very matted root system. In some cases it may be better to slice away small matted areas. This is an alternative technique to employ in order to be sure that field soil will be in intimate contact with the roots that you want to get very quickly out into the surrounding soil.

One of the most important ways to help a tree re-establish its root system is to dig a wide planting hole to ease root re-growth. A larger hole will accommodate well-aerated backfill soil. Your goal should be to minimize impediments to this poor tree that is burning up its stored reserves, desperately trying to put on the root system left behind at the nursery.

Don’t stop with digging a wide, shallow hole. Think about what you will be putting back into that hole.

**Tree and shrub preparation**

If we don’t inherit a good root system, what should we do? Some recommend slicing through the root system. Unfortunately, we find that too many people can go a little crazy doing this. They will slice too much and cut too much of the root system. The old technique of cutting up through the bottom of the root system and splaying it out, which was called butterflying, can create problems, too. As people pull that root system open, they break too much of it.

At the planting site, wire baskets, burlap and ropes of all different compositions wrap the root ball. These materials may have helped the nurserymen harvest the tree and hold the root ball together until it was planted, but those materials become un friendly at planting time. Even natural, untreated, single-layer burlap may not break down fast enough. (Ideally, “fast enough” means the day after the tree is planted!) Roots need to get out to the surrounding soil right away. The only way that will happen is if burlap isn’t there at all. If there is any physical barrier, no matter the composition of the material, it will impede establishment. It behooves us to unpackage these plants.

The nursery industry prides itself on being able to give us balls that are packaged in materials that will not break down. That is fine through the holding process, but once the tree is planted it will try valiantly to grow through these materials. Roots may girdle in these materials, interfering with the vascular system.

Most of the time, it isn’t possible or necessary to unwrap the root ball completely. Cut the ropes, pull the nails and drop the burlap. Don’t even worry about getting it out of the planting hole. Roots grow out laterally. If you can’t get rid of all the burlap down the side, at least remove those top couple of inches where the bulk of the

**To a lot of people this is just gorgeous looking. It is staked rigid and wrapped. In most cases, neither are necessary.**

Alternative methods are slowly being adapted by the industry. This one allows the trunk to wiggle inside. It keeps the tree in place — and protects it against tourists — yet allows the tree to establish its root system.

**Why stake a tree? It should not be to give a person a place to hang flower baskets. This person was at least imaginative.**

Many people rely on references that give them the cold hardiness ratings for plants. We now also have heat zone ratings with which arborists are less familiar. The warmest part of a state in the winter isn’t necessarily the warmest part in summer. Visit the American Horticultural Society’s Web site (www.ahs.org/garden/gdnheatmap.htm) for more information.
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absorbing roots grow.

Roots that girdle in wire baskets may be a contributing factor to the decline of some trees. How should we modify the basket? Do we just cut out the top? Do we split them and lay them down? Wire basket modification or removal is one of the big fights in our industry. Arborists generally recommend getting barriers out of the way. The nurserymen don’t think we should alter the way they package a root system because they will not guarantee the tree. We need a happy compromise that is backed up with sound research. We are starting research to look at what the baskets may do to the root systems and at what rate baskets degrade. Two of the big basket manufacturers have expressed interest in such research because they realize that there is a potential problem and they want to do their part.

Amending the soil

When a hole is dug mechanically, the equipment may glaze the walls of the planting hole. Be sure the roots can get through the slick wall by roughing up the wall. During dry periods, the wall bakes pretty hard and the roots can’t get through.

Make sure that the surrounding backfill soil stays moist as well. Backfill part of the soil from the planting hole, wet it down to get it re-hydrated, settle the air pores, and snug it around the root ball of the plant. After that, backfill with the other half of the soil and wet it again.

Water doesn’t flow through the soil if the pore spaces of the different materials in the ground are very different. If a container-grown tree’s roots are surrounded by substrate or bark with large pore spaces—and the existing soil backfill has very small pore spaces—water is going to stay in the existing soil until it is saturated. Only when it is saturated will it move into the backfill soil. When everything else is saturated, that water then moves into the very large pores in the root ball. This process is what lets root balls dry out before the roots grow out of them and into the surrounding substrate. This phenomenon is called hydrologic discontinuity.

Efforts to minimize the differences in pore sizes of all the materials surrounding tree roots are important. That is why amending the backfill soil in a very small planting hole doesn’t make sense, because it will encourage roots to stay either within the ball or the backfill soil and not grow.

Plan ahead. This guard is to keep the weed eaters from whacking the trunk of the tree. This tree might need a tree guard all the way up, because cars are going to run into the trunk. This guard wasn’t installed soon enough and the poor tree is suffering.

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out into the surrounding soil. Backfill amending should only be considered if a large planting area or very wide hole (where textural differences will be minimized) is possible.

On a different note, if nurserymen can fertilize trees starting as soon as they line them out in their fields and it doesn’t hurt the trees, then why should it hurt if you fertilize at planting time? It won’t if you use the correct type and amount of fertilizer. I can understand the fear before controlled-release fertilizers became available. Too much of a standard agronomic fertilizer (salts) will burn the root system. Controlled-release fertilizers won’t, as long as correct rates are used. Fertilizers add the most important nutrient for new root growth – nitrogen. Nitrogen is not typically in the soil but it is needed as a fuel source for the root system to grow.

Incorporate a small amount of fertilizer in the first half of the backfill soil. Water to make sure it is hydrated and the fertilizer dissolves, especially if granular fertilizer is applied.

Don’t pile the extra soil that was displaced by the root ball against the trunk of the tree. The extra soil can be shaped into a well-like area or reservoir for water, or removed from the site. Finally, provide plenty of water until the original root system has been replaced, which may be several years in northern climates.

Add mulch after backfiling and watering to keep water in the soil around the growing root system. Use a thin layer – 1 inch or 2 inches of fine material or 2 inches to 4 inches of a coarse material. (Coarser material needs to be thicker for weed control.) Make the mulch ring as large as possible to hold more water over the root system and remove grass and weeds. Keep mulch away from the trunk of the tree because extra water may rot the trunk.

Landscape fabrics, which may be used under mulches, are effective against annual weeds, but generally ineffective against perennial weeds. A better approach to controlling weeds is to top the mulch with a pre-emergent herbicide. Do not put pre-emergent herbicide on the soil and then put the mulch on top of it. Putting it on top will keep anything that may blow in from germinating.

After planting

The plant needs every branch and leaf to produce food to replace the lost root system. Leave it alone except for structural corrections that really cry out. Don’t prune anything more than necessary in the first year or two.

In most cases, don’t stake or wrap the tree either. A lot of wrapping materials that supposedly modify the environment for the trunk of the tree so that it doesn’t suffer from frost cracks actually cause greater temperature extremes. Determine the need on a site-by-site, time of year, and species basis. Figure out what you are trying to achieve. Are you trying to modify the environment around the trunk of the tree? Are you trying to protect the trunk of the tree against people, equipment or animals? In the latter case, some type of guard is better than a wrap.

I did a study on wraps and trunk guards...
that determined that, in most cases, wrapping does not benefit trees. There are some sound environmental reasons to wrap—such as transplanting a thin-barked species in spring or planting into a hot parking lot island. If you need a wrap, I would recommend a soft material that can be installed without rope or plastic ties that end up girdling the trunk of the tree. There is a white polypropylene material that decomposes in the sun. Within six months it turns into a powder and sloughs off the trunk of the tree.

If physical damage to the trunk of the tree is likely, then pick a suitable guard. Some guards simply keep the weed-eaters and other lawn equipment from whacking the trunk. A larger tree guard could keep cars from running into the trunk. Be sure any guard is loose and allows air circulation so moisture doesn't build up and create an environment more conducive for sprouts, adventitious roots, or pathogens.

Just like trunk protection, staking should require a compelling reason—if it is going to blow over or if people are going to push it over. The root system cannot get established if it is hanging up in the air. Analyze the situation and ask yourself if there is a reason the tree will not stay upright. Too often we see trees that were staked and left. Plants end up “eating” the guying because it was left too long. Once the root system has had enough time to establish in the soil and anchor the tree, there is no function for stakes.

Root ball securing can also be done below ground. If stakes would be unsightly or a liability, then guy the root ball. This is done along the Virginia Beach oceanfront so the tourists don’t get caught in the guying, and for aesthetic purposes.

Thus far, research generally does not support the use of bio-stimulants at planting time. The greatest benefit comes from water. There is no dispute that mycorrhizal roots are good for all of our trees, but in many cases inoculant products are totally unnecessary because the root systems may be coming from the nurseries with roots that are already colonized by mycorrhizal fungi.

When planting a tree, more is involved than just digging a hole. From a soil standpoint, soil type, drainage, nutrient content and possible amendments need to be considered. From an establishment standpoint, supplemental watering, mulching, pruning, staking and trunk protection should all be considered on a site-by-site, tree-by-tree basis. One size or one planting specification does not fit all. And finally, remember that even if your installation and follow-up maintenance procedures are well chosen, if you don’t shop for a good root system, or if you pick the wrong tree for the wrong location, your tree will have little chance of establishing or thriving.

Dr. Bonnie Appleton is a professor of horticulture and an extension nursery/landscape specialist at Virginia Tech University’s Hampton Roads AREC in Virginia Beach, Va. She is the author of a new book, The New York/Mid-Atlantic Gardener’s Book of Lists.
Find Real Value in Valuation

By Mary McVicker

Valuation?

Who, me? I’m not planning on selling my tree care business anytime soon!

Placing an accurate value on your business is important for a variety of reason, whether or not you plan to sell your business anytime soon. Situations arise that involve personal or legal reasons for arriving at an accurate valuation. Valuations are required in partnership disputes, for instance, or in problems with dissenting shareholders. This may sound like something that applies only to very large corporations; it isn’t. Although these types of problems aren’t very common (or publicized), in closely held corporations there is always the potential for disputes if there are shareholders. Disputes aren’t the only circumstances that trigger the need for valuation.

A change in the form of ownership, such as adding or subtracting a partner, requires valuation of that partnership interest. Personal situations, such as divorce or estate matters, often entail valuation of the business.

In many borrowing situations, the creditor wants at least a partial valuation to help ascertain the strength of his security. Many potential lenders will be more positive about a loan request if the borrower has a recent valuation that highlights the equity account.

Someone who is considering advancing money that will increase the debt capital of the business is going to want to see a substantial buffer of equity that offsets the debt. Balance sheets don’t tell the whole story regarding equity; a valuation is much more informative to a potential lender.

Valuation comes into play in many insurance questions, including those involving how to protect the assets of the business — and how much protection is needed. Finally, a valuation gives a particular view or assessment of the business, highlighting the business’ strengths and putting a sharp focus on its weaknesses. Therefore, it’s worth considering what a valuation says about your business, regardless of your intent to borrow. The starting point is the classic methods of valuation.

Valuation techniques

The classic technique is book value. This can be a problematic technique in establishing a value for a business, and many experts recommend it only in particular situations. The IRS views book value as tied into the historical or accounting value of assets over liabilities, which bears no direct relationship to fair market value.

The “book” referred to in establishing value is in fact the business’ books. And, as we know, accounting data is historical. The figure on the books for key equipment may date from six years ago and reflect all those years of depreciation. Taking this one step further, depreciation is based on a formula, an “accounting convention,” and any resemblance to the actual decline in value is coincidental.

Recognizing these problems, there’s often a stipulation when book value is used that assets be given an appraised value that reflects existing price levels. Book value is generally used when a business is liquidating.

Using market value works particularly well when stock is publicly traded, or in the limited instance when comparable companies are traded. This method — when comparable companies that are traded — sounds better in theory than in practice.

Companies differ too much to be comparable for this purpose; they have different capital structures, generally sell a different mix of products, have different accounting practices, and so on. In any case, few tree care companies are publicly traded.

Capitalization of income is a better method of valuation. Because valuation is so closely related to the reality of what a company will earn, valuation that reflects earning power has a strong element of common sense to recommend it. (If you decide to investigate this method more closely, you’re almost certain to find, however, that “common sense” is not mentioned. I rather favor common sense myself.)

Factors in your business

How would you value your tree care business? What are the key factors that add to its value? Detract from its value? The balance sheet could be used as a starting point, but the pitfall is that you don’t consider all the factors (both assets and liabilities) that aren’t on the balance sheet. Consider the intangibles, for instance. Accounts receivable, which do show up on the balance sheet, are misleading.

“I’ve got $7,800 in accounts receivable” loses some of its luster when you realize that $4,000 of that amount is over 90 days old. You may be likely to collect only 25 percent of that amount, which sadly reduces the value.

Even more important for a tree care business are the key people in your business — a prime intangible which is difficult to place a value on. Organizational charts routinely assume that those key people are at the top, and it’s those people of course
Intangibles can also be problem areas. These, too, are part of a true valuation of a business, although they are rarely represented in a valuation. When you’re scrutinizing your own business, you’ll want to look carefully for these intangibles as well.

A consistently high turnover of employees is not only a problem, it’s a symptom of other problems. Certainly there are cycles in this; when the job market opens up after having been stagnant for a period of time increased job movement is inevitable, which looks like high turnover. It’s easy to differentiate this from a consistent rate of high turnover.

A high turnover of customers can be subject to cycles, too, but a business whose customers consistently go elsewhere when they could return for additional purchases or service has a problem. This is also a symptom of something seriously wrong.

Standing contracts with vendors or customers can be a positive or negative intangible, depending on the nature of the agreement and how it plays out. While long-term contracts sound desirable because of the stability they imply, a poorly bid contract tends to remain an unprofitable contract throughout its duration. It can strengthen the business base, or it can weaken it.

Your valuation

Take a step back from your business. If you were an outsider who knew little about it, how would you value your business? What would make you more interested in the business? What would cause doubts? What would scare you off? This isn’t merely an academic exercise. It’s a vehicle for figuring out how to sharpen your business and its practices. It’s also a matter of practicality. We don’t know what lies ahead — but we do know that the time to prepare for the future is now.

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

Lynn Hendrix of Lynn Hendrix Truck & Equipment, LLC of Livingston, Texas, has been awarded the Franklin Equipment Company Industrial Division Dealer of the Year award for 2001. Lynn Hendrix Truck & Equipment had the best sales record in the country for Franklin Environmental Brush Cutters in 2001.

4 Elected to Dow Board

Stockholders at The Dow Chemical Co.’s 105th Annual Meeting recently elected four members to the company’s Board of Directors. Elected to serve three-year terms were Jacqueline K. Barton, Anthony J. Carbone, Barbara Hackman Franklin and Harold T. Shapiro. All of the candidates were previously serving as directors.

Care of Trees Joins Chicago Wilderness to Save Natural Resources

The Chicago division of The Care of Trees recently became one of the 12 founding members of the newly launched Chicago Wilderness Corporate Council, a partnership of more than 140 public and private organizations that have joined forces to protect, restore and manage the region’s natural lands.

The Chicago region is one of only a few metropolitan areas in the world with a high concentration of globally significant natural communities. Some of these communities, such as native woodlands, grasslands, streams and wetlands, are rarer than tropical rainforests.

The ecosystems in the Chicago region also are home to nearly 200 species of plants and animals listed as endangered or threatened by the State of Illinois.

TIME Mfg. Adds Eight New Distributors

TIME Manufacturing recently appointed eight new distributors in their West Coast division. The new distributors include: AG Body, Salt Lake City, Utah; Bobs Service, Anchorage, Alaska; Dealers Truck Equipment Co., Shreveport, La.; Great Pacific Equipment, Anaheim, Calif.; Proctor Equipment, Portland, Ore.; Tom’s House of Hydraulics, West Sacramento, Calif.; Utility Trailer Sales of Idaho, Boise, Idaho; Versalift Southwest, Waco, Texas.

TIME Manufacturing is in the initial phases of sales and service training seminars for the new distributors.

Silver Streaks Now Sold Under Oregon Brand

Silver Streaks lawn and garden products, currently sold in the U.S. by Frederick Manufacturing, will be sold under the Oregon brand name worldwide. The U.S. Silver Streaks sales force will merge with the U.S. Oregon sales force.

“We are excited by the opportunity to synergize the best practices of Frederick and Oregon into an organization more responsive to the needs of our present and future customers. The consolidation of advertising, marketing, sales and purchasing will absolutely result in a stronger, more market-driven product line with amazing growth potential for all our customers,” said Jim Osterman, president of Blount, Inc.’s Outdoor Products Group, which comprises Oregon Cutting Systems, Frederick Manufacturing, and Dixon Industries.

Lowe’s Names Copeland Regional Vice President

Lowe’s Companies, Inc., recently announced Michael Copeland has been promoted to regional vice president of the company’s north central region.

In his new position, Copeland will be responsible for leading six district managers throughout Nebraska, Kansas, Missouri, Iowa, Illinois and parts of Indiana. He will report to Nick Canter, Lowe’s senior vice president, store operations - northern division.

Copeland joined Lowe’s in 1993 as a store manager in Fayetteville, Ark. He has served Lowe’s as a district manager for the past five years, most recently in the company’s California stores.

He has 24 years of home improvement retail experience.
Lewis Tree Service Tops Communications Awards

Lewis Tree Service, Inc. of Rochester, N.Y., received two Awards for Communications Excellence from the ESOP Association at its Annual Conference in Washington, D.C. The conference brings together employers and employees of companies with ESOPs (Employee Stock Ownership Plans). The awards recognize the outstanding communications programs of its members. Lewis came in first in the “Total Communications Program Award, 1001-5000 Employees” and won runner-up in the “Printed Materials Award, Over 250 Employees.”

Selection criteria included ability to convey concepts of employee ownership, respect for the contributions of employee owners, integration of the ESOP into the fabric of the company, encouragement of ownership attitudes, creative use of ideas and technical quality.

The judges commented that, “this company has a wonderful overall communications program, very informative, including the nuts and bolts. With a staff of 1200 employee, Lewis has met the challenge by taking ESOP meetings out to the owners.

There is an ESOP newsletter, as well as space for the ESOP in the general company newsletter. Notice this company’s history, quality control and customer satisfaction feedback. Lewis communicates with an employee owner force, which is 95 percent out of the office and bilingual.

Their communications include such programs as Q&A, Bingo, Show Me the Money, The Cutting Edge and Ownership & You. Lewis has a great slide show and uses the ESOP acronym, Enthusiasm, Success, Opportunity and Productivity.”
290-LTC Tool Carrier
Lang Tool Co. has introduced the 290-LTC tool carrier for power mowers, a modified excavator equipped with an auxiliary hydraulic system that can continuously produce 130 gpm at 5,000 psi. The engine is a 440 hp Cummins N-14, and a gearbox is installed on the rear of the engine to drive an auxiliary pump to operate attachments and the standard excavator pumps for travel, swing and operating the boom and stick functions.
For more information, contact Lang Tool Co., 2520 Glidden Road, Beaverton, MI 48612; phone: (989) 435-9864; fax: (989) 435-4311.

Please circle 92 on Reader Service Card

Compact Skidsteer Loaders
National rental chain HSS RentX has introduced the versatile Kanga range of compact skidsteer loaders and attachments. It measures 74-by-39-by-49 inches and is designed to be maneuverable for landscaping, forestry, erosion and debris management, groundskeeping, construction, fencing and more. It has a 550 lb. lift capacity, and it is possible to rent a variety of specialized quick-release attachments, including carryall and leveler, 4-in-1 bucket, hydraulically driven auger, and a heavy-duty tiller.
For more information, contact HSS RentX at 1-877-711-7368.

Please circle 91 on Reader Service Card

Root Water System Series
Rain Bird Corp.'s Accessories Division has introduced a new Root Watering System series designed to support tree health and growth. The RWS series precuts include an irrigation retaining cap and a 36-inch long tube made of a proprietary semi-rigid mesh that allows air, water and other nutrients to bypass compacted soil in order to reach deep root systems. The RWS can be ordered with pre-installed irrigation components that include a swing assembly, check valve, riser and Rain Bird 1401 bubbler. The RWS is also designed to accommodate drip tubing and emitters as an alternative installation, and can be used in urban tree settings, as they encourage roots to grow down instead of along the surface. For more information, contact Rain Bird Corp. at 1-800-RAIN BIRD, use automated fax-back service at 1-800-724-6247 or visit www.rainbird.com.

Please circle 90 on Reader Service Card
Perkins 800 Series
Perkins Engines Co. has launched a compact new engine in the 43kW to 60kW (58hp to 80hp) power band. The Perkins 800 Series is a family of two 4-cylinder engines offering a capacity of 3.3 liters – a 10 percent increase on its predecessor, in a package that is comparable in size. The engines are available in two versions: naturally aspirated, indirect-injection (IDI); and turbo-charged, direct-injection (DIT). The Perkins 800 Series is Tier 2/Stage 2 compliant and offers a noise reduction of between 1 and 3 dB(A). For more information, contact Perkins at www.perkins.com.

Loglift 135Z and 165Z
Loglift has introduced two new models: the 135Z and 165Z. The lightweight “Z-mount” offers a long telescopic reach and optimal lift capacity. In addition, the Z-mount folds tightly back onto itself, across the width of the truck without added height or width, saving load space and allowing the truck to be utilized for multiple duties. The hydraulics are smooth and the controls are designed to be precise and easy to use. For more information, contact Loglift at Tehdaskatu 7, P.O. Box 54, 24101 Salo, Finland, phone +358 204 55 2599, e-mail info@loglift.com or visit www.loglift.com.

Built-Rite Model 24 HPWS
Built-Rite Model 24 HPWS Woodsplitter is designed specifically for tree services and large firewood operations. The 24 HPWS has a 24 hp motor, a single stage hydraulic pump, true 8-second cycle time, 25 tons of force and hydraulic 4- and 6-way wedges. It can split up to three cords per hour. The unit comes with a 25-gallon hyd. tank, tool box and separator grate. For more information, contact Built-Rite Manufacturing Corp., Ludlow, Vt., or call 1-800-757-2520.

Toolite Shovel
The Toolite shovel has a blade filled with strategically placed pea-sized holes. These holes allow the material to release from the shovel easily and make the shovel lighter than a similar sized conventional shovel. Despite the holes in the blade, little material seeps through, making it ideal for use in lawns, vegetable and flower gardens, mud, dirt, gravel, and even moist sand. Toolite Inc. will also be expanding the product line with additional specially designed shovels for the consumer market. For more information, contact Toolite at 1-800-833-2495 or visit www.toolite.com/shovel.

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Steer Clear of Anti-Trust

- price fixing
- bid rigging
- customer allocation
- territory division

Do not cross DANGER! Grey areas of the law!

JAIL TIME and/or FINANCIAL PENALTIES

Understand the Law

Teaming up with other businesses is a great way to boost profit. Working together, you can promote sales in your industry or town, reduce your cost of employee benefits, and even exchange security information. But when does honest cooperation turn into restraint of trade by dividing up areas of a town or agreeing to limit low bids - a dangerous violation of federal and state antitrust laws?

The answer is important because infractions carry stiff financial penalties and jail time. Small business owners must be particularly concerned about state laws that mimic the federal Sherman Antitrust Act. Nearly every state has passed legislation prohibiting collusion between businesses.

"State attorneys general are getting much more vigorous," warns Irwin M. Stelzer, an economist, attorney and author of The Antitrust Laws: A Primer. "They have tasted blood in the Microsoft case. And they have more resources to prosecute, because of the money coming in from the tobacco lawsuits."

Obviously, small companies in the green industry will never be rich and high-profile targets like Microsoft. Yet attempting to "fly under the radar" of such laws is risky, given the opportunities for whistle-blowers. Disgruntled employees and terminated personnel, for example, can enjoy financial rewards for reporting antitrust violations. And wrongdoers can avoid jail time by turning in their co-conspirators.

For that matter, a whistle blower is not a required element in an antitrust investigation. Plenty of circumstantial evidence tends to accumulate in these matters. It can include travel and expense reports, telephone logs, and business diaries.

Violating the law can be costly in terms of money and jail time. Violations of the Sherman Act - which covers businesses large and small - carry penalties of up to $10 million for corporations and $350,000 for individuals. There is also mandatory jail time of up to three years. Finally, victims of antitrust activity may pursue restitution of up to three times the amount lost.
Don't cross that line

Avoid crossing the line by understanding the law. "If there's one simple statement that should be made and repeated to small- and medium-sized businesses, it's this: Don't get together and fix prices," warns Robert Lande, professor of law at the University of Baltimore and a member of the board of directors of American Antitrust Institute in Washington.

The four big areas of concern in the antitrust area are:

1. price fixing
2. bid rigging
3. customer allocation
4. territory division

You break the law when you agree with someone else to control these areas. "The agreement is the offense," explains Gregory J. Werden, a senior economic counsel at the antitrust division of the U.S. Department of Justice. "There doesn't have to be any actual action taken."

Even if you fail to follow through after agreeing to control the market, you have still committed a felony. While "just talking" about the topics without an agreement to collude is not illegal, wise business owners avoid things that may raise red flags.

"The act of talking about coordinated pricing or other strategic business decisions with rivals can come back to haunt a businessperson," says Werden. "The fact that there was a conversation raises the question whether the participants agreed to price fix or bid rig."

Avoid misunderstanding by not discussing such topics. Be aware, too, that you need not be in control of a market to violate these laws. In the eyes of the law, a small operator with a tiny market share can be as guilty as a large corporation.

Don't fix prices

The law prohibits you from colluding with other businesses to fix prices. Once the fact is established that you have done so, there is no real defense.

"You can't say 'I fixed a reasonable price,'" warns Lande. "The court won't even listen to your evidence. And you can't say that you were just trying to be fair or that you were avoiding ruinous competition."

You also cannot argue that the collusion was necessary to prevent price cutting, or that the conspirators were only trying to make sure each got a fair share of the market. A further caveat: It is not necessary that competitors agree to charge the exactly the same price to break the law. Any collusion that serves to restrict price competition qualifies as a criminal act.

Here are some related actions that, when done in collusion with other businesses, break the law:

- Establishing or adhering to price counts.
- Holding prices firm.
- Eliminating or reducing discounts.

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- Adhering to a minimum fee or price schedule.
- Fixing credit terms.
- Not advertising prices.

As you can see, the crime of price fixing goes well beyond the straightforward maintenance of price levels, into more indirect methods of maintaining a hold on the market.

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Credit Decisions Are
Made In-House

• Fixing credit terms.
• Not advertising prices.

As you can see, the crime of price fixing goes well beyond the straightforward maintenance of price levels, into more indirect methods of maintaining a hold on the market.

Don’t split the market

Equally illegal as price fixing is splitting the market by customer category or territory. Sometimes the competing companies will allocate specific customers. Perhaps the largest customers in the market are parceled out equally so everyone gets an equal share of the pie. Other times, the allocation is based on region or by type of business. All such cases violate the law. Saying, “I’ll serve these customers; you serve the others,” is called “customer allocation” or “market division.”

There is a big difference between such collusion and the simple act of responding to a local market force. You can say, “Gee the guy next door is selling X, so I will not try and compete. I will sell Y.” But you can’t get together and make that decision.

Treat all competitors equally

As this article stated up front, teaming up with competitors for mutual benefit is allowed. But generally speaking, such teamwork should be open to all comers. Avoid joining forces with some of your competitors to the disadvantage of others. Here we enter a gray area. Some forms of cooperation, such as joint research and development activities, are permissible if their main purpose is to improve efficiency. Others are more questionable.

It’s always dangerous to enter gray areas of the law, and by all means consult a good attorney if you are unsure about your project. Be aware that federal and state authorities are vigilant in pursuing any activity that serves to dampen the free market.

“There is a myth that because we have elected a Republican administration they will go soft on anti-trust issues,” relates Stelzer. “But it’s not true that fewer cases are filed under Republican administrations.”

The prudent businessperson will follow a conservative road. There are many legitimate communications, but there are also many illegal ones. When you converse with one of your competitors, be careful of what you say.
99 GMC C7500: CAT 3126, 210 hp, 7 speed, 33,000 lb GVW, with 65 ft TECO V6-65IP-4TFE2 bucket, 2 man end-hung basket, 14 ft steel flatbed. $69,500.

97 FORD LT8000: 8.3L Cummins, 275 hp, 8 spd +lo +lo/lo, 58,000 lb GVW, with PIONEER 2000 crane, 124 ft total hook ht. $79,500.

99 INT 4700: T444, 190 hp, 5 spd + 2 spd, 33 GVW, 14 ton USTC crane, 111 ft hook ht, 20,130 miles. Like New. $69,500.

93 FORD F700: 6.8 L diesel, 170 hp, 5 spd + 2 spd rear, 25,000 lb GVW, with 9 ton MANITEX 956 crane, 86 ft total hook ht, 16 ft steel flat. $36,500.

99 INT 4700: T444, 190 hp, 5 spd + 2 spd, 33 GVW, 14 ton USTC crane, 111 ft hook ht, 20,130 miles. Like New. $69,500.

97 FORD F350: V10 auto, with 28 ft EAGLE bucket. 6,000 miles. NICE! $24,900.

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99 WHITE/GMC WG64: 3306C CAT, 300 hp, 8 spd, 54,000 lb GVW, 7½ ton NATIONAL N95 knuckleboom, 39 ft max side reach, 16 ft wood flat. $49,500.

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Events & Seminars

Don’t miss these upcoming events

July 11-12, 2002
Tree Educator's Summit
By Dr. Alex Shigo
Portsmouth, NH
Contact: (603) 436-1493

July 13, 2002
"Summer Tree Identification Program"
Hidden Lake Gardens,
Tipton, MI
Contact: MFPA, (517) 482-5530 or
ashby.ann@acd.net

July 16, 2002
"Ornamental Horticulture and Landscape Maintenance"
University of Michigan, Ann Arbor
Contact: MFPA, (517) 482-5530 or
ashby.ann@acd.net

July 18, 2002
Summer Meeting
Connecticut Tree Protective Association, Inc.
The Farmington Club
Farmington, CT
Contact: (203) 484-2512 or www.CTPA.org

July 25-26, 2002
Washington State Nursery and Landscape Association
2002 Emerald Expo
Stadium Exhibition Center
Seattle, WA
Contact: Vickie Wilson, 1-800-672-7711,
vicwsnla@nwrain.com
or www.emeraldexpo.com

July 28-31, 2002
78th Annual Conference
International Society of Arboriculture
Seattle, WA
Contact: ISA Housing Bureau, (330) 425-9330 or
isa2002@conferon.com

July 30-31, 2002
Turf and Landscape Field Days
Virginia Tech and Virginia Turfgrass Council
Blacksburg VA
Contact: David Chalmers, (540) 231-9738,
chalmers@vt.edu or David McKissack, (540)
231-5897, turf1@vt.edu

August 9, 2002
Tree Appraisal Workshop
San Antonio, TX
Contact: Jody Hagen, (210) 655-4670

August 20, 2002
"How to Sell your Services/Products Successfully"
Marriott Eagle Resort
Ypsilanti, MI
Contact: MFPA, (517) 482-5530 or
ashby.ann@acd.net

August 28-30, 2002
California Interior Plantscape Association
CalScape Expo
San Francisco, CA
Contact: (707) 482-2276 or
cipa@cipaweb.org

September 13, 2002
ISA-Ontario Annual General Meeting
Brant Conservation Area
Brantford, Ontario
Contact: (519) 376-1882

September 18, 2002
Virginia Tech Hampton Roads Agricultural Research and Extension Center
27th Nursery and Landscape Field Day
Virginia Beach, VA
Contact: Bonnie Appleton, (757) 363-3906 or
bapple@vt.edu

September 19, 2002
Making Trees Your Business
Waynesboro, VA
Contact: Kathy Sevebeck, (540) 557-2363
or www.treesvirginia.org

September 19-20, 2002
“Hands-on Plant Health Care”
Summer Meeting 2002
Multi-Lakes Conservation Camp
Walled Lake, MI
Contact: MFPA, (517) 482-5530 or
ashby.ann@acd.net

September 25-26, 2002
Multi-State Ornamental Plant Materials Conference
Stillwater, OK
Contact: Mike Schnelle (405) 744-7361 or
mas@okstate.edu

October 3-4, 2002
New England ISA
36th Annual Convention
Cambridge Marriott
Cambridge, MA
Contact: Marcia Charter, (978) 266-8990 or
macharter@prodigy.net

November 7-9, 2002
National Arborist Association
TCI EXPO 2002
Midwest Express Center
Milwaukee, WI
Contact: Carol Crossland, 1-800-733-2622, Ext. 106, crossland@natlarb.com

Send information on your event to:
Tree Care Industry, 3 Perimeter Road, Unit 1, Manchester, NH 03103
Fax: (603) 314-5386; E-mail: Ziminsky@natlarb.com

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Recordkeeping -
Do You Know Your Responsibilities?

If you have more than 10 employees (including part-timers) at any point during the year, then your firm is required to keep records of its occupational illnesses and injuries. This requirement is enforced by the Occupational Safety & Health Administration, OSHA.

OSHA recently revised its recordkeeping requirements and forms. The revisions and new forms being phased in between January 2002 and January 2003 are as follows:

<table>
<thead>
<tr>
<th>Name of the form</th>
<th>Last year</th>
<th>This year</th>
<th>Next year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of Occupational Illnesses/Injuries</td>
<td>200</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Summary of Occupational Illnesses/Injuries</td>
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<td>200</td>
<td>300A</td>
</tr>
<tr>
<td>&quot;Recordables&quot; Supplementary Record</td>
<td>101</td>
<td>301</td>
<td>301</td>
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The Accident/Ilness Log
(Form 300)

The OSHA log must be presentable within 40 minutes in the case of an audit. In order for this report to be accurate, accident reports must be recorded in a timely manner.

In your company includes more than one establishment, then separate logs for each establishment must be maintained, and each recordable case should be recorded on the log for the establishment in which the employee was injured or became ill.

Lost workday cases occur when the injured or ill employee experiences either days away from work, days of restricted work activity, or both. When counting the number of days away from work or days of restricted work activity, do not include:
1. The initial day of injury or onset of illness, or
2. Any days on which the employee would not have worked even though able to work (holidays, vacations, etc.).

Termination of employment may stop the count of lost workdays if unrelated to the employee's injury or illness.

Employers are required to record all work-related injuries and illnesses that result in days away from work on the OSHA Log 300, whether or not the employee has chosen to seek medical treatment for the injury or illness.

Employers should record all back cases as injuries.

Work days lost prior to medical diagnosis must be recorded.

An OSHA-recordable injury makes no distinction between incidents that are compensable under state workers’ compensation laws, incidents caused by employer neglect, incidents that are preventable, or the random incidents that seem to happen when no one is at fault.

The administering of a vaccine booster after an exposure incident is considered medical treatment and therefore recordable on the OSHA Log 300 because the exposure incident is evaluated as an injury for OSHA recordkeeping purposes. Getting a hepatitis B vaccine booster in response to a potential exposure to bloodborne pathogens or a tetanus booster following injury from a rusty nail are examples of "medical treatments" intended to protect the employee from the onset of the disease from that exposure incident as well as future incidents.

The Accident/Ilness Summary
(Form 300A)

As of next February, you must post an annual summary (Form 300A) of occupational injuries and illnesses for each establishment. This summary shall consist of a copy of the year's totals from the form OSHA No. 300 and the following information from that form: calendar year covered, company name, company address, certifying signature, the signatory's title, and the date. If no injuries or illnesses occurred in the year, zeros must be entered on the totals line, and the form must be posted.

The summary has to be completed by Feb. 1 for the previous year and posted on the employee bulletin board or other prominent area during the entire month. Posting requirements change when your business has no fixed establishment, or multiple establishments.

The Supplementary Record
(Form 301)

A supplementary record (Form 301) must be filled out within seven (7) calendar days of the report of a recordable illness/injury.

Each employer, or the officer or employee who supervises the preparation of the log and summary of occupational injuries and illnesses, certifies that the summary is true and complete by his/her signature at the bottom of the last page of the summary or by appending a separate statement to the summary certifying that the summary is true and complete. Workmen's compensation, insurance, or other reports are acceptable alternative records if they contain the information required by the 301 Form.

Further information and instruction on your firm's recordkeeping requirements can be found at the OSHA Web site www.osha.gov, or in programs such as the Model Company Safety Program from the National Arborist Association.
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The Strongest Name In Rope
Old School vs. New School:
The Benefits of Quality Training

By Tim Jackson

Amazing changes have come by way of the integration of rock climbing and rapelling technology that have made tree care at least more interesting for climbers. The question is: Have these changes made climbing “safer, easier and more efficient?”

“Old school,” for the purpose of this article, will refer to older-style gear – butt-strap saddles, snaps, ropes without eye splices, tautline hitches, no-split tails, and the body-thrust method of ascent. “New school” will refer to leg-strap saddles, Blake hitch, split tail, carabiners, eye-spliced ropes, secured footlock, throwlines, slack tenders, and false crotches. With the exceptions of ascenders and half a dozen other innovations, these are the notable advancements.

Since 1997, I’ve been putting the new school to a variety of tests and practice exercises to gain proficiency. With a good working knowledge and several years climbing with these techniques, I’ve reached a conclusion. New school good. Old school still good. just harder and less efficient. Safer is open to debate without comparative numbers directed to these exact differences. I’ll leave that for another day. But I can say that less fatigue equals safer work. However, more gear means more entropy. First of all, entropy is a law of the universe wherein all things move toward disorder, and secondly, the more complicated a system, the more energy it takes to maintain order. Entropy is how your shop becomes a disaster area unless you keep after it.

So by adding hardware, do we not get “safer, easier, more entropy?” Not necessarily. The key here is training in gear management, and being professionally driven to master the techniques. In short, more gear does not equal more entropy if you know how and when to use them.

ArborMaster Training, Inc., and others have contributed enormously to the development of training in the new school. Their influence has invigorated this industry and added excitement in the climbing community. I took Level 1 to 4 from ArborMaster and gained a great deal of respect for the new school. I got so much out of it that we began Davey’s Advanced Arborist Training Program (modeled after ArborMaster’s).

We took three experienced climbers ages 25 to 40 whose productivity we had been tracking for two years, which established a baseline. We then put them through our Advanced Arborist Training Program. For about three months, their productivity dropped by 10 percent on average, but this 10 percent drop was the learning curve, and should be expected. After the three months, each person gained an average of 30 percent in productivity over the baseline. (See graph.)
What we realized after the training was a 30 percent across-the-board increase in productivity. Before this training, they were effectively operating at 75 percent of their potential. Remember that these are some of our best, and they are dedicated to mastery of techniques; not every foreman will excel to this degree.

What we saw was a change in how they approach the tree, conduct job briefings, and a host of other differences in how they go about their work. For example, we noticed the trained workers would establish a tie-in point higher in trees to begin a climb rather than body thrusting up to the second limb.

They also started using blocks for false crotches instead of natural crotches for rigging. This isn't faster than a natural crotch, but the gain is more consistent control and it is easier to tie off pieces.

The parts of the training that are hardest to quantify are the improved training skills, as well as the improvements in attitude and professionalism. What these foremen have done is raised the crew's output by demonstrating excellent attitudes and by spending time teaching. That's right - spending time to make more time.

It's not the gadgets that increase productivity; rather it is the training and attention to the task that made our people more efficient. You might think this article would end with an endorsement of every kind of hardware available, but it can't.

About 50 percent of the course focuses on safer chain saw operation, reduced downtime with the saws, more accurate felling and more teachable techniques. Twenty-five percent focuses on climbing techniques including new gear; 25 percent focuses on safety, job briefings, and predicting the reactive forces before beginning a job. Gear doesn't increase speed on a job site any more than 5 percent of the whole. So why do we have the new school gear? The gear makes it easier and more efficient, which in turn reduces fatigue and frustration, thereby increasing safety. Safer, easier, more efficient.

Tim Jackson is the manager of national recruiting for the Davey Tree Expert Company in Kent, Ohio.
What to Expect at TCI EXPO 2002

What a lineup we've got for you at EXPO 2002! Our stellar speakers are ready to share with you the most important lessons they have learned in their years of experience in the tree care business. Sign up now to attend EXPO 2002, and gain access to the pros who can share with you the secrets of:

✓ Preserving Trees During Construction
✓ Saving Trees from Drought
✓ Profiting from Wood “Waste”
✓ Building a Life-saving (and money-saving!) Safety Program
✓ Getting Top Dollar for Every Job
✓ Writing A300 Specs
✓ Making Work More Fun and Productive
✓ Selling success!

Dr. Philip Wargo kicks it all off with the Keynote Address, “Consequences of Prolonged Drought on Trees and What You Can Do About It.”

Two dry bands of drought straddle the nation: The first runs up the East Coast from Georgia to Maine, the second blankets the Rocky Mountain States down to the southern tip of Texas and west to California. Predictions are that drought is likely to persist or intensify. Amid water ban discussions and rising water costs, trees silently suffer, because drought is a leading cause of plant stress.

Dr. Philip Wargo has developed and evaluated procedures to measure tree health and to predict the onset of decline.

These are the many other great seminars you can look forward to:

“Have More Fun at Work with Modern Arboricultural Techniques,” by Tom Dunlap.

Technological advancements in the past 30 years have affected many aspects of arboriculture, and they could make your days in the trees much more numerous and enjoyable.

Tom Dunlap is the owner of Canopy Tree Care and a partner in Tree Climbing Team-USA in Robbinsdale, Minn. He teaches arboriculture at Hennepin County Technical College and serves as the advisor to the Urban Forestry Club at the University of Minnesota.


Dr. Blanchette will discuss what happens as trees are invaded and decayed in the urban landscape and provide insights on how trees defend themselves. His work is in the area of forest pathology and wood microbiology with research in tree defense mechanisms, deterioration processes of wood, biotechnological uses of forest fungi, biological control of forest pathogens, and the conservation of archaeological wood and wood of historic value.

“Preserving Trees During Construction,” by Jim Kringer.

Jim Kringer will discuss how to save trees during construction projects, with an emphasis on paving. Mr. Kringer has worked for the city of Milwaukee for 33 years, the past 22 in engineering and road design. He set up the city’s inspection program that has drastically reduced the number of construction-related tree failures.

“How to Write Pruning Spec’s Using A300,” by Tim Johnson.

When you use the A300 Standard to write pruning specifications, you set consistently high expectations for your clients, your management, your salespeople, and your crews. Tim Johnson, owner of Artistic Arborist in Phoenix, has served for over 10 years as the chairman of the ASC A300 Committee. He’ll show you how to successfully communicate your expectations using the newly revised A300 Pruning Standard.


Is your company’s safety program one of the things that contributes to your success, or one of the things that stands in your way? This free session will acquaint you with the NAA’s Model Company Safety Program to help you bring new life to your own program. The panelists will lead you on an exercise to evaluate your program’s strengths and weaknesses, and will share experiences that have made safety programs “come alive” in other companies.

“New Life (and Profits) From Old Trees.” Dr. Sam Sherrill & Steve Bratkovich.

If you are like most arborists who process wood waste into chips or firewood, there is a potentially profitable wood utilization alternative right under your nose: turning urban trees into finished lumber products. Dr. Sherrill of the University of Cincinnati and Steve Bratkovich of the U.S. Forest Service will share their research, knowledge of the markets, and other information you will need to decide if this is a potential profit center for your firm.

“Managing and Scheduling Work Crews,” by Tony Bass.

Tony Bass grew the company he started (Bass Custom Landscapes) to over $2.5 million in annual sales while working in a county that has a total population of barely 100,000 people. In this session, he focuses on key areas and methods of efficiently and effectively managing one crew to multiple crews, including scheduling and routing, job costing on the job, downtime, planning in advance, and motivation and people management skills.

“Supervisor’s Skillbuilder’s Workshop: Practical Techniques to Improve Quality, Productivity and Morale,” by Lou Benson, Ph.D.

Over the past 20 years, Lou Benson, Ph.D., has developed and presented many of the nation’s most popular seminars in the areas of change, leadership, team build-
ing, sales and marketing, customer service and quality improvement. Managers will find powerful tools on leadership, supervision, staff motivation and growth that they can implement immediately.

"Interviewing and Hiring Talent in the New Millennium," by Jean L. Seawright, CMC.

Jean L. Seawright, CMC, is the author of the popular "Employment Genie," the hiring, coaching and termination system of choice for small businesses. Jean will transform complicated hiring concerns into simple, logical and clear solutions. Using the insights, inspirations, and proven principles she has applied to her successful consulting ventures, she will share practical and useful tips for hiring talent during the "new war."

"How to Get Top Dollar for Every Job," by Jeff D. Stokes.

Jeff D. Stokes is the CEO of Pinnacle Performance Group, Inc., an organizational development solution provider. In this session, attendees will learn how to: predict what the buyer is willing to pay and what the competition is likely to bid; calculate the minimum acceptable markup for any project; and make adjustments from bid performance to land more dollars per job. Participants will learn how to allocate overhead to ensure they aren't overpricing the big jobs and under pricing the little ones; establish operational support and sales support capacity; and price their time accordingly.


As an internationally known expert on sales and customer service, a best-selling author and a dynamic and entertaining speaker, Hal Becker makes more than 120 presentations a year to organizations that include IBM, Disney and AT&T. Attendees will learn that being the best takes an easy-to-follow system. Hal uses his own experience as Xerox's No. 1 salesperson, along with a 10-step common sense, back-to-basics approach to give them the tools they need to succeed.

"Growing Your Business with Improved Customer Service," by Kennette Reed, CLP.

Kennette Reed, CLP, is a customer service specialist, marketing professional, speaker, author and interior landscape consultant. Participants will learn why every staff member must provide excellent customer service; how improvements in service quality affect customer retention; the true costs of acquiring new customers; the long-term value of retaining existing customers; what tools your customer service staff needs to be successful; and how to be thankful for customers who complain.
The relentless onslaught of development in urban/wildland interface areas creates many forestry-related controversies and questions. The first question usually surfacing is simply: What do trees really do for people and the environment in an urban setting? The obvious implied question being, "Why bother preserving existing trees or planting new trees?"

Answers are often given in shades of vested interest due to the complex structure of today's urban societies. The underlying fact is that trees — especially in an urban environment — provide ecological, economic, and social benefits. While these benefits are usually considered separately, they are actually interrelated components of an environmental whole. For instance, even a single tree providing watershed protection connects people to the land, offers an area of shade, and can increase property value in varying degrees (depending on locale and type of tree).

A closer look

Trees also reduce energy use, clean the air, enhance wildlife habitats and offer psychological benefits for humans that research is just beginning to define. Older trees often maximize these benefits. (One large tree can provide oxygen requirements for four people.) Urban trees and forests come in many forms, varying from park groves to garden thickets. Regardless of what collective or solitary forms they appear in, all trees are capable of providing multiple benefits. Trees absorb pollution, prevent soil erosion, reduce glare, enhance recreation areas, protect against cancer-causing ultraviolet rays, turn vacant lots into playgrounds, serve as teachers, identify communities, provide employment, and even catalyze spiritual and creative inspirations.

Tale of two cities

One recent study compared the urban forests of two Florida cities: Gainesville and Ocala. The specialized study examined influences of the urban forest on reducing pollution and heat effects caused by residential electrical use. Results of the study...
were surprising and definitive.

Residential electrical use in Gainesville was 935 kilowatt hours per month vs. 1,075 kilowatt hours per month in Ocala. Yearly savings in Gainesville was estimated at $126 per household; Gainesville's strict tree ordinance policy was credited with the savings. Ocala's absence of savings was attributed to absence of effective tree ordinance policies.

Other studies

Another study emphasized urban forest values in Modesto, Calif. This study revealed that benefits of the city's 90,000-plus trees exceeded management costs by a factor of nearly two, offering substantial savings justification for the annual municipal tree budget of more than $2 million ($14.36 per resident and $28.77 per tree).

Modesto's budget for mature tree care totaled 74 percent of the total urban forestry budget. Aesthetics and other benefits were estimated at $1.5 million ($17 per tree), with an annual air pollutant uptake having an implied value of nearly $1.5 million ($16 per tree).

One of the most significant factors determined by the Modesto study involved energy savings; building shade and cooler summer temperatures saved more than 110,000 MBtu, valued at $870,000 (122 kilowatt hours per tree, $10 per tree). Other benefits were determined related to stormwater runoff (292,000 cubic meters or 845 gallons per tree, valued at $616,000, or $7 per tree). Reduction of atmospheric carbon dioxide totaled 13,900 tons or 336 pounds per tree (valued at $460,000, or $5 per tree).

More in-depth and detailed studies like the Modesto project are needed to show the exact benefits of the Model Urban Forest approach to management.

Other studies have also shown that urban trees can have a positive impact on the financial success of commercial areas. A University of Washington study indicates that shoppers are willing to pay as much as 10 percent more for certain goods and services if businesses are located on tree-lined streets. An increasing number of studies are revealing the psychological influences of trees.

Ecological benefits

Ecological benefits are obvious in stormwater and watershed planning. As a vital part of the ecological system, trees have a sheltering role in the environment. Planting trees combined with reducing impervious surfaces — such as parking lots and sidewalks — buffers bodies of water from runoff and associated pollution. The GFC guidebook, however, points out that not all locales should be planned for 15 percent or less impervious areas because this would offer a role model for sprawled development.

Spatial patterns of urban trees are vital to ecological benefits. One measure of ecological health is connective patterns of natural systems. Roads and utility line corridors can be barriers to some wildlife species, since the ability to travel between habitats is often important for survival.

Social benefits

Social benefits of trees are well-documented in a number of studies. One...
research project, however, turned up some unexpected benefits. A University of Illinois study revealed that residential buildings with greener surroundings had fewer crimes committed in the area; this reduction included both property crimes and violent crimes.

The Illinois research determined that residential buildings with high levels of vegetation had over 50 percent fewer crimes in the vicinity than buildings with lower levels of vegetation. It was found that a "sense of safety" was associated with widely spaced, limbed-up trees with low plantings, in contrast with dense woods having shrubs or underbrush of any kind. This study also linked green environments with reduction in mental fatigue, a condition which often accompanies violent behavior.

Trees improve health

If an urban forest had no other benefits, this factor alone should establish urban forestry management as a high priority in any city or community budget: trees actually improve physical and mental health of human beings. Statistics now show that in the United States, the total annual cost of human exposure to outdoor pollutants is $40 billion to $50 billion. Combine this financial cost with an estimated 50,000 to 120,000 deaths associated with air pollution, and the seriousness of the problem becomes obvious.

In relation to these disturbing statistics, every individual living in an urban environment should consider the fact that trees trap airborne particulates and reduce carbon dioxide. The result: pollution is reduced and the air becomes much healthier to breathe.

Many economic, ecological and social benefits of trees - especially in an urban setting - are being revealed by research. A tree-lined walkway into an urban building can create a natural sense of well-being for occupants. Sociological studies now show that surgical patients looking out hospital windows at trees instead of a barren landscape or a concrete jungle have shorter hospital stays and require less medication.

Believe it or not, research studies show that an environment with trees can reduce human stress and recovery time for hospital patients. Surgical recovery patients - looking out windows at trees
porting the benefits of preserving and enlarging the urban forest canopy, saving all existing trees is not compatible with continued economic growth in urban areas. However, it is possible to reduce the amount of removed canopy and replant trees in a way that results in only minor changes to environmental patterns. The changes a community is willing to make to accomplish this objective reflects an understanding of urban forestry and commitment to the future.

Holistic perspective

All urban forestry economic, ecological and social benefits combine to create a sense of stability that makes people feel secure about where they live. In this type of environment, people are willing to pay for the Model Urban Forest – especially when they are aware of the multiple benefits. Planning for the future and cultivating trees that will grow old and large are key factors in urban forestry development. To do this, growing space above and below ground must be provided. Maintaining a healthy root system is critical to long-term health of any tree. The space needed to grow a tree is at least as large as the drip line (most trees have roots that extend far beyond the drip line).

Making space for tree crowns and roots can be a challenge in any urban forest setting, but the benefits gained can be well worth the effort. With proper planning and applied knowledge, today’s fragile seedling can be tomorrow’s towering oak.

This article reviews sections of the GFC publication (Georgia Model Urban Forest Book) providing communities with information for preserving and developing a green infrastructure in an urban environment. For further information on the Georgia Model Urban Forest Book, contact Susan Reisch at (404) 298-3935.

Trees trap airborne particulates and reduce carbon dioxide. The result: urban pollution is reduced and the air becomes much healthier to breathe.

versus a barren landscape or concrete jungle – had shorter hospital stays. Also, these patients having access to natural views required fewer medications for pain and received two-thirds fewer negative evaluations by nurses.

Development reality

Despite overwhelming evidence supporting the benefits of preserving and enlarging the urban forest canopy, saving all existing trees is not compatible with continued economic growth in urban areas. However, it is possible to reduce the amount of removed canopy and replant trees in a way that results in only minor changes to environmental patterns. The changes a community is willing to make to accomplish this objective reflects an understanding of urban forestry and commitment to the future.
What is burnout?

All work involves some degree of stress, yet certain professions have much higher amounts of stress than others. The seasonal nature of tree care, which is characterized by frantic bursts of sales and immediate work to be completed, makes arborists a prime target for stress problems. Burnout can be defined as a psychological state caused by unrelieved work stress. It is characterized by exhaustion, depersonalization and feelings of decreased accomplishment.

Many studies of burnout have focused on professionals who have extensive contact with other people — nurses, teachers, therapists and police officers, to name a few. This is also often true for business entrepreneurs, and many consider the small business one of the more stressful. The greater the initial involvement, the greater the likelihood of eventual burnout.

If you've been working very hard with no time off, you may be a candidate for burnout without knowing it. If others — colleagues, family members or employees — have been working hard along with you, they also may be headed toward burnout. They may get there first, in fact, because they're not the ones in control.

Because the stage may be set for burnout long ahead of time, it can also be prevented with effective intervention.

Warning signs of burnout

Here are the stages of burnout and
their warning signs:

1. **Decreased enthusiasm.** We all know what the initial exhilaration of a new job or new responsibility is like. If one’s expectations aren’t met, however, the job loses its appeal. It’s no longer interesting or exciting, and enthusiasm wanes.

This is barely noticed at first by an individual or those around him. A worker may still be performing adequately but may begin to turn to hobbies, social life or other interests for satisfaction.

2. **Detachment.** At this stage, the individual knows that something is wrong, as do others in their immediate environment. The employee puts in his or her time at work, and is exhausted, irritable, angry, ill or depressed.

3. **Turning point.** As time progresses, this type of individual is not functioning adequately on or off the job. He or she is plagued by self-doubt, escape fantasies or physical illness. The individual may now leave his or her job. In extreme cases, some individuals may contemplate suicide.

Notice that it is not work overload that leads to burnout. More frequently the cause is not having work-related needs or expectations met. If you are overworked but are amply rewarded, economically and otherwise, you probably won’t burnout, at least in the short term.

As a tree care business owner/manager, you have certain expectations for your business as well as personal expectations. You may experience burnout if your operation doesn’t progress rapidly enough, if profits or sales decline, if overhead increases without an increase in income, or if economic conditions threaten your survival.

There are non-economic reasons for burnout, too. Some people open their own businesses with expectations for free time, being with their families and engaging in hobbies and recreational activities. The business, however, turns out to be all-consuming.

Also, just as employees find themselves in the wrong job, business owners can start up or inherit businesses that don’t suit them. When the work and the individual are ill-matched, burnout may occur.

But there are ways to make life more bearable even when you and your vocation are a less-than-perfect match.

In addition to being conscious of stress factors in your working environment, you as an individual can learn new ways of coping so that business difficulties and other sources of stress have less impact on you physically and emotionally. Used effectively, these 10 strategies can prevent you from overreacting to immediate situations and leave you relaxed but alert so that you become more productive.

**Ten techniques to avoid burnout**

Here are some proven strategies for coping with stress in the workplace (and at home):

1. **Learn to relax.** Even if you must force yourself, you will last a lot longer if you take time for relaxation. Learn to find ways to let go of tension, ways to erase all negative and disturbing thoughts from your mind. Take regular vacations; even short ones will help.

2. **Eat well, exercise regularly.** Avoid fast foods whenever possible, and pack a healthy salad one day or more per week. Exercise, even if it’s just a long walk at

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**Percentage of workers who report their jobs are “very or extremely stressful.”

<table>
<thead>
<tr>
<th>Percentage</th>
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<tbody>
<tr>
<td>40%</td>
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**Percentage of workers who report they are “often or very often burned out or stressed by their work.”

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**Percentage of workers who report they feel “quite a bit or extremely stressed at work.”

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**Percentage of workers who view their jobs as the No. 1 stressor in their lives.

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**Percentage of workers who believe the worker has more on-the-job stress than a generation ago.

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<tbody>
<tr>
<td>75%</td>
<td>Princeton Survey Research Associates</td>
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the end of the day.

3. Get enough sleep. Everyone needs different amounts of sleep to feel rested. Determine what you need and make it a habit to get it, every night.

4. Forget the minor issues. Stressed people tend to worry too much. Most issues take care of themselves and all the worry in the world won’t help. Be realistic and only focus on things you can change and that are really important.

5. Don’t go to sleep thinking negative thoughts. Force your mind to think of pleasing times and positive ideas. You’ll be amazed at how refreshed and positive you are when you wake up.

6. Practice not losing your temper. In a dispute, the person who loses is the one who starts yelling first. Sometimes people will actually bait you into anger by making inflammatory remarks. Keep focused on the real issue and never let anyone cause you to get mad.

7. Get yourself organized. A cluttered and disorganized workplace leads to a cluttered and disorganized life.

8. Get a life! Being a workaholic, having little or no interests outside your work, is a sad and pathetic way to go through life. No matter what’s going on, make time to spend with loved ones, friends and acquaintances on a regular basis. Find time for a hobby, find time to practice any religious beliefs you may have, find time to relax.

9. Develop and maintain a sense of humor. Naturally you would not want to make jokes at a funeral, but most of life’s problems do have a funny side if you look for it. Do so when appropriate. Relieve the tension for yourself and others. Life is far too short to walk around upset and tense all day long.

10. Learn and use time management skills. It’s proven that people who are under a great deal of stress frequently don’t understand nor practice good time management, thus making many problems much worse than they need be. Strategies such as setting daily priorities, delegating the more trivial work, finishing one task before you start another, learning to say “No” when someone requests your time, are just a few time management strategies that can help you through each day more effectively.

A few resources

Finally, recognize that you might not have all the skills necessary to practice some of the strategies suggested here. For instance, technique No. 1 tells you to relax, let go of tension. But how? It’s easier said than done. It may be necessary for you to obtain additional resources. You’ll find bookstores and libraries are your best starting places. Here are two good ones of many available:

Managing Stress for Mental Fitness, by Merrill Rabner and George Dyck. ISBN: 1-56052-200-3


Good luck!

Ted Tate is a nationally known author and trainer. He presents business training programs at in-house meetings and conventions nationwide. He offers additional free stress-management tips at his Web site: www.trainingsexpert.com.

TCI

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TCE

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TCE
Hydraulic Infeed Chipper Operation
From The TreeWorker files

The TreeWorker newsletter is a monthly publication of the National Arborist Association. It is designed to promote safe and efficient operations in the field by educating arborists in the proper use of tree care equipment, tools and supplies. Below is an example of the types of safety articles highlighted each month in the TreeWorker.

Starting the chipper

Before you start the chipper, be sure:
♦ the clutch is disengaged;
♦ the chip discharge chute is pointed in a safe direction;
♦ the chipper hood lock pin or hood bolts are secured;
♦ the infeed chute is free of tools or foreign objects;
♦ the feed control bar is in neutral;
♦ all personnel are clear of the machine.

Now you’re ready to start the chipper. Follow the manufacturer’s guidelines for starting the motor and engaging the clutch.

After you start the chipper:
♦ slowly engage the clutch;
♦ slowly raise the engine RPM to full throttle;
♦ check the operation of the feed control bar and hydraulic feed roller;
♦ check the clutch; if it engages too easily, it might need to be adjusted.

Stacking Brush

Brush for the chipper should be stacked in a way that makes it easy and convenient for the operator to feed the chipper.

In most cases, that means that the butt ends of the brush should face the infeed chute.
Feeding Brush

If you are working on the street, be aware of traffic, and try to always work from the curbside.

When possible, feed material into the chipper from the side of the infeed chute to minimize the chance of being struck by material as it is being pulled into the chipper. Limbs have a tendency to move around as they are feeding into the chipper. By feeding from the side, you can avoid getting hit by the flow of material into the chipper and having to step over the limbs as they are being pulled into the machine. On chippers with mechanical infeed, feeding from the side puts the operator within easy reach of the feed control bar.

Always feed the larger, or butt end, of the branches into the chipper first so the feed wheels will open, allowing smoother operation.

If branches are fed into the chipper the wrong way:

1. Branches can become wedged in the disc knife chipper’s throat past the feed wheels, making it very difficult to back the material out.

2. Lateral branches will catch on the edges of the infeed chute of the drum chipper, causing the chipper to sever the branch rather than pull in the entire branch.

When feeding large limbs into a rotary drum chipper, you should hold the brush end of the limb higher than the butt. The limb will slide forward into the blades. When feeding small limbs, throw them into the blades. In both cases let go of the brush before your hands cross the plane of the hopper and before the brush hits the chipping blades. After you feed material into the machine, pivot your body and turn your face away in one continuous motion.

When feeding into a rotary drum, you should push small material against the blades with a long limb. You can also lay the material on the feed table and shove a long piece of brush in after it.

Vital safety points

♦ Never reach or kick into the infeed hopper of a chipper for any reason!
♦ Never attempt to unclog, service or clean the infeed hopper area while the machine is running.
♦ Never use tools such as rakes or shovels to push brush through or to clear the infeed chute.
♦ Never feed material containing rocks, wire or foreign debris into the chipper. Anything other than brush will not only dull chipper knives, but may cause knives to break and could damage the disc or drum, bearings or anvil, or cause projectiles to be thrown from the machine.
♦ Never feed vines or vine-type mate-
Here's a New Breed of Chipper

The 1400SD is the latest addition to our full line of brush chippers ranging from 6", 9", 10", 12" and now 14-inch capacity. The 1400SD is the largest 90 degree in feed disc style chipper on the market today. Patent and patent pending features like threaded knives, slide back feed roller and hopper assembly, ratchet style feed system, and self cleaning non clogging bottom feed roller are just a few outstanding features found only on Dosko.

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Chipper Maintenance Made Easy
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Cut the vines into 4- to 5-foot lengths and lay them on top of the longer material.

Try to feed large-diameter material while smaller pieces are going through the feed system. Smaller pieces will partially open the feed wheels, making it easier for the feed wheels to allow the large-diameter pieces to feed. Large pieces can be cut off with a sharp angle to make feeding easier.

Large-diameter wood may cause the engine to lug. You do not want the engine to slow down to the point that it will stall or plug the chipper. When you hear the engine slowing down on a hydraulically fed chipper, push the feed control bar to the neutral position to stop the hydraulic feed wheels. When the engine regains full RPM, pull the control bar and resume chipping. Some machines with feed sensor features do this automatically.

Material too large for the chipper opening must be cut to the capacity of the chipper. Keep a chain saw handy when chipping large-diameter or limby material. Should material become jammed in the feed system, reverse the feed wheels to dislodge the material.

Stay out of the chip discharge area when the chipper is running and the cutter wheel is turning, even if brush is not being fed into the chipper. Chips discharged at high velocity can cause serious injury.

The TreeWorker newsletter is written by arborists for the field employees of commercial tree care companies. Each issue gives employees "How to ..." pointers on subjects such as improving client relations, rigging, and avoiding vehicular accidents. Tech Notes, Knot of the Month features and Safety and Pest Alerts make this monthly publication "must" reading for company owners and field employees alike.

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A well-trained tree is easier to maintain than an untrained tree. At left, this London plane (*Plantanus acerifolia*) has good structure: vertical spacing between branches, strong attachments, radial distribution of branches, and a strong central leader. These structural characteristics make maintenance pruning straightforward. Conversely, at right, this elm (*Ulmus sp.*) has poor structure and pruning will be problematic. Multiple branches arising from one point on the trunk, weak attachments, and a dense canopy make pruning difficult.

Training Young Trees for Structure and Form

*Dr. Larry Costello*

Most trees are not trained when they are young. They may be staked and watered, but little or no attention is given to pruning for structure and form. If trees are pruned, they are typically not pruned correctly. Young tree training has not become an integral part of arboriculture practice. This is in spite of the fact that educators such as Dr. Richard Harris have told us for years that training is a vitally important practice.

One reason typically offered for not training trees is related to cost: tree managers say they can’t afford to prune young trees. Money is set aside for staking and watering, but not for pruning. The fact of the matter is that you can’t afford not to train young trees – it costs more in the long run to maintain an untrained tree.

I surmise that another reason trees aren’t trained is that many arborists simply don’t know how to train them. They are not clear on the objectives and the procedures. They may have bits and pieces of the process, but they don’t have a clear picture of what needs to be accomplished.

Here, I will discuss the reasons for training young trees (why you can’t afford not to do it), and describe a five-step process for training young trees.
Certain maintenance costs can be avoided by training young trees. This large Italian stone pine (*Pinus pinea*) developed co-dominant stems and a large number of labor hours have been invested in canopy thinning to reduce end weights. This work and expense could have been avoided if the tree was trained to have a single, central leader.

Being structurally stronger, trained trees are likely to be longer-lived than untrained trees. This elm (*Ulmus sp.*) needs to be removed because a co-dominant stem failed. Although the tree was in good health and may have lived for many more years, it needs to be replaced because of a structural weakness. Tree longevity in urban forests can be increased by training.

### Reasons to train young trees

Why do we need to focus attention on training young trees? For three reasons:

1. Trained trees will be structurally stronger and have a lower failure potential than untrained trees.

2. Trained trees will be easier and less costly to maintain than untrained trees.

3. Trained trees have a greater potential to be longer-lived than untrained trees.

First, by eliminating structural defects during the training process, a trained tree will be structurally stronger than an untrained tree. Being structurally stronger, it will have a lower potential for failure. This is a worthwhile objective in urban forestry because reducing failure potential translates into reduced hazard potential or reduced risk of personal injury and property damage. As professionals, we need to do as much as we can to reduce failure potential in trees, and training is one key practice that will do so.

Second, if a tree is trained when young, maintenance time and cost will be reduced as the tree matures (see Figure 1). Trained trees have well-spaced and well-attached branches. Typically, they have fewer branches than untrained trees. This means fewer defects to address in the mature tree, fewer branches to prune, greater canopy access for arborists, and a simplified plan of work.

In addition, costs can be avoided in trained trees. Structural defects in untrained trees—such as co-dominant stems and closely-spaced branches with included bark (see Figure 2)—often require special attention. This work can be very costly and time-consuming. If these defects are eliminated in the young tree, these costs can be avoided.

Finally, trained trees have a higher potential for retention in the urban forest than untrained trees. As described, untrained trees often have structural defects that lead to failure. In many cases, trees have to be removed when partial failures occur.
The height of the lowest permanent branch (scaffold) is determined by the tree’s location (Step 3). For street trees, the lowest scaffold over the sidewalk will be approximately 8 feet, while over the street a scaffold should be no lower than approximately 14 feet. In parks or turf areas, the lowest scaffold may be at 6 feet.

Structural defects, such as co-dominant stems, can be easily eliminated in young trees. This large tree has high aesthetic appeal, but it also has a relatively high risk rating due to its weak structure. It takes hand pruners and a few minutes to correct this when the tree is young.

Developing a strong central leader (Step 2) is a critical part of training young trees. The central leader serves as a backbone for the development of scaffold branches. There should be only one leader per tree! This Brisbane box (Tristania conferta) has a strong central leader.

For these reasons, we can’t afford not to train young trees. This practice needs to become an integral part of young tree care for commercial, municipal and utility arborists. The limited time and resources invested in training a young tree will pay dividends when the tree is mature.

How to train young trees

Five simple steps are outlined here that will produce well-trained trees. They apply to most deciduous and broadleaf evergreen trees, regardless of species or use (park, street, residential, etc.). Conifers are addressed separately. They do not apply to trees that are specialty-pruned: espaliered, pollarded or multi-trunk trees.

The 5 Steps should be followed in sequence. For information on types of pruning cuts and how to make cuts, refer to the ISA Tree Pruning Guidelines or ANSI A300 Pruning Standards. For further information on training young trees, refer to Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines, by R.W. Harris (1999) and An Illustrated Guide to Pruning by Gilman (1997).

Step 1: Remove broken, diseased, dying or dead branches. Look around the tree and if you see any broken, diseased, dying or dead branches, remove them behind the point of injury. In some cases the whole branch may need to be removed. In other cases, just the injured part can be cut off.

Step 2: Select a leader and remove competing leaders. The leader is the central stem of the tree. Carefully follow the trunk of the tree from bottom to top. The trunk
should narrow into a single stem that is in a vertical position (see Figures 4 and 5). This is the leader. There should be only one leader! If there is more than one leader (competing leaders), then the strongest and most vertical stem should be selected as the central leader and other stems removed, cut back, or possibly selected as a permanent branch (see Step 4).

**Step 3:** Select the lowest permanent branch (also called the lowest scaffold branch). The lowest permanent branch is the lowest branch attached to the trunk that will remain on the tree throughout its life. The position or height of the lowest permanent branch is usually determined by the location and use of the tree (see Figure 6). For street trees, the lowest permanent branch over the sidewalk may be 8 feet (2.4 meters), while over the street it may be at least 14 feet (4.3 meters). Branch heights for street trees are often mandated by local ordinance. For trees in parking strips, the lowest permanent branch may be 6 or 7 feet (1.8 or 2.1 meters) if it is positioned parallel to the parking strip. The lowest permanent branch for trees in parks or yards will often be lower than that for street trees, but this will depend on specific use and maintenance considerations.

Look for a vigorous branch with a strong attachment that meets the height requirement (see Figure 7). Its stem diameter should be half (or less) of the trunk diameter where the branch attaches to the trunk. You may want to label or tie a piece of string on this branch so you know that it has been selected as the lowest permanent branch and you can identify it later. If the tree is too small to select a branch at the desired height, then you will have to wait until the tree grows taller (see Step 5).

Smaller “temporary” branches should be left close to the lowest permanent branch. Larger temporary branches should be pruned back to one or two buds.

**Step 4:** Select scaffold branches and cut back or remove competing branches. Scaffold branches are the permanent branches of the tree that constitute much of its framework. Scaffolds are located above the lowest permanent branch and are selected based on spacing and size considerations. Remove branches that have weak attachments (e.g., with included bark). These should not be used as scaffolds.

Vertical spacing between scaffolds should be 15 inches (45 cm) or more for trees that are expected to achieve a trunk diameter of 12 inches (30 cm) or more at maturity (see Figure 8). For smaller trees (trunk diameter less than 12 inches at maturity), scaffold spacing of 12 inches or more is recommended.

Scaffold branches also should be spaced radially around the trunk, like spokes in a wheel. This vertical and radial spacing of scaffolds gives the tree good balance and form. Select scaffold branches starting with the lowest permanent branch and proceed up around the trunk.

**Note:** If the selection of scaffolds is made difficult because of the selection of the lowest permanent branch, then it may be better to see which vertical and radial selection will give the best total selection. In some cases, it will be necessary to go back to Step 3 and reselect the lowest permanent branch based on the best combination of scaffolds.

Selected scaffolds should have strong attachments. Branch diameter should be no more than half the diameter of the trunk at the point of attachment. Remove branches that are close to the scaffolds (within 4 inches) and are of equivalent size. If competing branches are needed to maintain canopy size, reduce their size by 50 percent or more. Leave small diameter branches as temporary.

Keep in mind that, as the tree grows, branch size and the space it occupies changes, and you may find that some branches are no longer suitable as scaffolds. In this event, a scaffold may need to be removed (e.g., it has grown too large and is crowding other branches), or a new scaffold may need to be selected. Be prepared to re-evaluate scaffold selection as the tree develops.

**Step 5:** Select temporary branches below the lowest permanent branch. Some or all of the branches located below the lowest permanent branch can be retained as temporary branches. Remove branches that have a diameter greater than one-third the diameter of the trunk at the point of attachment. Shorten the length of temporaries to two to four buds.

**How much to prune?**

Generally, no more than 25 percent of a young tree’s canopy should be removed in any one year. In many cases, removing only 5 percent or 10 percent of the canopy will be sufficient to develop good structure and form (e.g., for trees with an excurrent form, such as *Liquidambar styraciflua*). In other cases, over 25 percent may need to be removed.
For instance, in cases where significant defects occur (e.g., co-dominant stems or weak attachments), a large branch or stems representing more than 25 percent of the canopy may need to be removed. Particularly vigorous trees (e.g., species of elm, maple, or acacia) may require more aggressive pruning to achieve branch spacing recommendations.

When to prune?
Both deciduous and broadleaf-evergreen trees should be trained primarily in the winter months when the trees are dormant. This is a time of minimal physiological activity and pruning will have the least impact on subsequent growth and development. Dormancy periods change with location and species, however. For instance, in much of California, the dormancy period will be December to February for most species. In Maine, many species will be dormant from November to March. At the earliest, wait until the leaves have fallen to prune deciduous trees. At the latest, prune well before buds swell and new leaves begin to develop in the spring for both deciduous and broadleaf evergreens.

Pruning during the growing season may be needed to remove diseased or insect-infested wood (e.g., shoots killed by fireblight), to direct growth, to remove growth obstructing signs, windows, etc., or to control watersprouts or suckers. This pruning should be kept to a minimum so as not to unnecessarily reduce tree growth and development. In some cases, pruning during the growing season should be avoided entirely for pest management reasons (e.g., to avoid attracting bark beetles). For trees with a tendency to develop suckers, it will be important to remove the suckers frequently during the growing season, particularly those within 6 inches (15 cm) of the ground.

It is generally recommended that newly planted trees not be pruned or are pruned very lightly in the first year. This is more important for bare-root or ball-and-burlap trees than for container stock. It is recommended that Steps 1 and 2 be applied in all cases. For container stock, Steps 3 and 4 can be applied if tree size is sufficiently large. For all stock types, temporary branches along the trunk should be selected and cut back (Step 5).

What do I do next year and in subsequent years?
You probably won't be able to develop the tree’s permanent framework (central leader and scaffold branches) in the first year. In fact, you may not even be able to select the lowest permanent branch or scaffold. Pruning in subsequent years will be needed in almost all cases. This pruning simply involves applying the 5 steps as done the first year: removing competing leaders, selecting scaffolds, removing temporary branches, etc. Plan to go through the steps each year until good structure and form are achieved (see Figure 9).

Conifers
The 5 Steps can be applied to conifers, but with some modifications. Steps 1 and 2 are important. Damaged branches and competing leaders need to be removed.
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Step 3 will be important depending on tree location. If clearance is needed for vehicles, equipment or people, then Step 3 should be applied. Step 4 is not as important for conifers as for hardwood species. In many cases this step can be bypassed entirely. Look for and remove branches with weak attachments, however. Step 5 will be needed if a lowest permanent branch is established.

Field practice

It will be very important to practice the 5 Steps before applying them. Review each step with a co-worker before making cuts. Tie a string or ribbon around the leader, the lowest permanent branch, and scaffolds. Discuss reasons for your selections and step back to evaluate potential impacts on tree form and size. After you are confident of your selections, make your cuts. Again, step back from time to time to assess changes in canopy size and form. Remember that species and conditions vary considerably and you will always need to use good judgment. Understand the reasons for the 5 Steps and make reasonable adjustments in the field.

By following the 5 Steps in sequence, you will produce a well-trained tree. In subsequent years, simply apply the 5 Steps again to ensure that good structure and form are retained. This hackberry (Celtis sp.) was trained in about 15 minutes. Four years after pruning, the tree has developed a strong central leader, vertical spacing between branches, strong attachments, and good form. It will be structurally strong and easier to maintain, and will outlive trees that have not been trained.

Dr. Laurence R. Costello is an Environmental Horticulture Advisor with the University of California Cooperative Extension. This article was excerpted and adapted from a presentation at TCI EXPO 2001 in Columbus, Ohio.
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Rhododendron Pruning – “My Rhody’s Too Big”

By Cass Turnbull

As a professional landscape gardener and arborist, I am frequently confronted by the client who complains, “My rhody’s too big!” I wish I had better news for them. The problem with rhododendrons is, well, they’re touchy. Sometimes one heads back a branch to a node, only to find that instead of sending out new shoots, the branch simply dies back. On other occasions, arborists reduce a rhododendron to the height or width they want, only to discover that by the time the plant has developed a decent full leafy crown, it is back up to about the size it was before. That’s the other problem with rhododendrons. All the leaves are at the outside edges of the plant. There’s nothing green to cut back to.

The hardest plants to prune are old, previously chain-sawed rhododendrons. The new growth looks like spaghetti. Although many can be brought back to a semblance of beauty with years of rehabilitative pruning, these casualties are often so indisputably ugly that removal is a more realistic solution. Just to confuse matters, radical reduction sometimes results in growth that is bushy, compact, healthy and shorter. Much depends on whether the species in question is healthy (and of a compact habit to begin with), and whether it receives sufficient sunlight to reestablish. Another commonly seen situation is that of a large-growing, open habit rhododendron (like the Loderi types) that someone is trying to keep shorter and more compact.

George Pinyuh, Seattle’s local extension agent, says, “Inside every rhody is a 15-foot tree trying to get out.” The hapless pruner tries in vain. Even when following the “rules” by selectively heading back branches to shorter laterals, the result is a “funny-looking” plant, which is to say it starts to grow in a roughly v-shaped pattern. With the above caveats in place, here is a summary of seven solutions to the too-big rhododendron.

Prune it

Many clients think their rhododendron is too big, but really it’s just too oppressive and/or crowded. Real pruning for health and good looks often solves the problem. The horticulturally
At left, a rhododendron renovated too high. The top does not go with the lower portion. When renovating (right), cut to a very low (6 inch to 12 inch) framework and regrow from the bottom up.

The correct pruner takes out the deadwood. Do this first and always. Prune out a few of the worst rubbing/crossing branches. Often it helps to take off some of the lowest branches, slowly working up and out from the inside. Also concentrate on thinning out the worst, most interfering branches that crowd into nearby shrubs, the house, the window, the gutter, or the walkway.

**Move it or the bed it is in**

Given the touchy nature of the beast, it is often a better and longer lasting solution to increase the shrub bed size to accommodate the plant. This is a creative but unpopular solution due to removal of sod involved.

Rhododendrons have broad, flat, fibrous root systems and are a relative dream to move. Landscapers often move plants that are larger than people. Another old saying is, “Your rhody will appreciate a trip around the house.” It may require up to four strong backs and a tarp to slide the offending rhododendron out of its present home and to its new one. Don’t be afraid to cut off 50 percent or more of the roots, both large and small. Immediate watering, and lots of water throughout the first year, is essential. Moving is the only logical solution for situations where shrubs were originally planted too close together or next to the walkway, as commonly seen in new landscapes everywhere.

**Selective reduction**

Is it under the window? One can attempt to “work back” the rhododendron, selectively heading it a little every year. Locate the tallest branch and follow it down inside the shrub to where it meets a lower and shorter lateral. Cut it off there. Repeat with the next tallest branch. Selective reduction works better on upward facing branches (the top of the plant). Aggressive pruning on the more horizontal
branches tends to develop new shoots that look like spaghetti.

Stop it in its tracks

If the plant in question borders high traffic areas – paths, stairs and such – one can snap off the new growth. After the plant has finished blooming one can either pinch out the new end-bud, or let the new supple shoot extend and snap it off using just fingers soon thereafter. Landscapers attest that on most species this will not prevent blooming the following year, though it is hard to understand why not. It is also exceedingly time consuming and must be done every year to restrict growth.

Arborize

On special occasions, a “too-big” rhododendron can be thinned and turned into an attractive small tree. The plant in question should be very large and old. It should have a thick, curvaceous trunk. One should meticulously deadwood it as well, and perhaps generally thin the upper canopy to prevent the “lollipop” look.

Radical renovation

In especially desperate and hopeless situations, it is sometimes appropriate to cut the entire plant nearly to the ground (or about a foot above) and start over. Like surgery, this is a serious move and you should exhaust other possible solutions first. Sometimes the plant dies. Most often it does not. I have been told that certain rhododendrons, called smooth-barked rhododendrons (ones with R. thomsonii blood in them) cannot break bud and therefore will die under hard pruning. If the variety is unknown, look for dormant buds at the base of the shrub that plump up in the early spring to about the size of pencil tip points. If they are present, one can be reasonably assured that the rhododendron has the capacity to re-grow when pruned hard. To succeed, the shrub should be otherwise healthy and receive sufficient light and water. Renovation works best on old and/or previously malpruned shrubs.

Do not try to be kinder by cutting less severely. Remember, after a plant is pruned the new growth starts just below the cut and grows up from there. If you don’t cut severely, it will be too big again very soon. And if reduction cuts leave too much of the framework, one winds up with a mismatched plant. The new, smaller leafy crown is stuck on top of thick, old “legs.” It just doesn’t look right. Plus there is a greater chance of producing the wild re-growth common on hard-pruned rhododendrons. But if it is cut lower to the ground, making a framework of one foot or less, the new shoots have no place to go but up.

I also recommend cutting the plant down (to a foot or so from the ground)
Mal-pruning below! Heading cut creates weak new shoots. To help the shrub look better, remove the lowest “goosenecks” (shown in black).

At left, a “leggy” rhododendron due to poor culture. On right, a naturally open and “tree-like” species.

1) Fresh heading cut
2) New shoot grows up
3) Bloom weighs down soft shoots
4) Next spring new growth heads up
5) Heavy blooms pull new shoots down
6) Process continues
7) To improve, prune off lowest part of “serial gooseneck”

all at once, instead of in stages as some recommend. If one cuts one-third of the trunks to the ground, like a cane-grower, the remaining evergreen canopy is likely to shade out the returning new shoot growth. Others advise cutting the entire plant lower by a third, and then a third again the next year, and then again lower, to achieve a smaller shrub in stages. I have come to believe that this causes the plant more stress than a single severe pruning to a low framework. The plant must deal with the injury three times instead of just once.

It will take several years to recover and look like anything. It will still need almost as much room to live and look good. Radical renovations should be done in the early spring as soon as all danger of frost is gone. Do not fertilize. Water well throughout the next year.

The “too leggy” rhododendron

A brave but unskilled gardener at the local pharmacy over-thinned a rhododendron on the grounds about 14 years ago. Instead of looking like a little tree, the internal branches were so narrow and awkward that it looked like a collection of broken arms and legs. And it has looked that way for most of the following 14 years. This year I noticed for the first time that the canopy had finally grown back together, hiding the internal branchwork. It looks decent. But no buds ever broke inside the shrub; all the new growth has been at the ends.

Many people have a leggy rhododendron that is the result of poor culture, not poor pruning. By this I mean it was planted in too much sun, or too much shade (like between two buildings) or there has been insufficient water or too many weeds. These problems were all caused by cultural conditions as opposed to pests or disease.

Like the pharmacy’s rhododendron, there’s not much help for them. It’s a good idea to try to eliminate the cause of legginess, but it will still take a long time, and perhaps never look better. The best one can do is deadwood. Get inside and remove each and every bit of it. On many branches you will find a tiny half-inch pointy peg of deadwood. It is the last bit of stem from an old bloom, still hanging on. Take those off too. Remove any branches hanging on the ground. The shrub will look cleaner and sort of artistic (maybe), or at least not so annoyingly awful. I also recommend that

Adjust your (or your client’s) attitude

Most often, the only thing a rhododendron is too big for is somebody’s idea of how big it should get to be. In this case, the cheapest and best solution is to learn to appreciate mature plants. A mature rhododendron can grow to be 10 to 20 feet — that’s two stories high. And some get up to 40 feet. This is not abnormal. The rhododendron is not “out of control.” It is not overgrown. It is not too big. It is simply the size it is genetically programmed to be. There is nothing wrong with a big rhododendron.

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Using a razor blade to "nick" a bud will force new shoots to grow at the base of the shrub.

the homeowner bring in some lower story plants to bring the eyes down. Use sword ferns, epimedium Lenten rose (*Helleborus o.* ) and half-buried, low-maintenance rocks. These help shift the viewer's focus away from the imperfect shrub.

If the cause of the problem is eliminated (perhaps by cutting down the Douglas fir nearby, or adding irrigation), one can try radical renovation. If the cause is not remedied, one will simply kill the plant or it will grow back leggy again. And take a moment to determine if the rhododendron is one of the species that is naturally open (leggy). Most of these rhododendrons have large, long leaves. If so, the plant cannot be successfully made smaller or more compact.

**Nicking the buds**

An old landscaper's trick to renew a big or leggy rhododendron is to nick the buds. This works according to the theory of apical dominance. For those not yet acquainted, the end bud on any branch is called the apical bud (apex, the top) or terminal bud (terminal meaning the end). This bud releases a chemical called an auxin (like a hormone) that travels down the stem (via gravity) just below the bark and keeps all the dormant buds from growing. If the terminal bud is removed (i.e. a heading cut) then dormant buds down below on the branch are released from apical dominance and are free to grow out (break bud). This is the plant's system of replacing damaged parts — if a moose eats it or a storm breaks a branch.

One can trick a rhododendron into thinking that the top is gone by nicking some buds. In the very early spring, locate the plumping buds down near the base of the plant. Use a razor blade to take a tiny wedge out just above the bud. One removes the bark and the first layer of green (the cambium) just below it. This will stop the auxin from reaching the bud. It will react as if the top were gone and will begin to grow out.

One can select five or 10 buds to nick. Be careful not to girdle the shrub by nicking all the way around like a ring. The vast majority of the cambium layer
must be kept or the shrub will die. The cut should be about 1/4-inch long and 1/8-inch or less deep.

The year it is cut, the bud will grow into an awkward-looking whorl of leaves. But the following year, it will branch out into several leafy stems. The year after, you will have a second shrub developing at the base of the old, leggy rhododendron. Then you may saw the top out.

Again, this process won't work if the cultural problem has not been corrected or if it is a smooth-barked type rhododendron.

Unfortunately, people love this gardening tip - so much so that it worries me. In reality, most of these people have perfectly good plants that are exactly the right size. The customer just thinks her rhododendron is too big. I would much prefer that clients transplant or simply accept their shrubs for what they are.

Layering

Another landscaper's trick is to layer mature rhododendrons, letting new ones grow up while selectively cutting out some of the large parent plants. If one stakes or pins down a piece of green branch to the ground, perhaps spreading a little soil over the point of contact, it will grow roots and become a new shrub. It's called layering, and it is how some people propagate rhododendrons.

Spaghetti

Some rhododendrons are not just leggy, their branches are ugly in the extreme. Inside are only long, skinny, roller-coaster branches that have one pathetic whorl of leaves on the ends. The cause is usually mal-pruning or sometimes too much shade. When a branch is headed back, the new shoot emerges, growing rapidly with soft- wood. When the bud at the end blooms, the weight of the truss pulls the soft young shoot down. As the season progresses, the shoot hardens off in that position. Next spring, off it goes again, headed up from the tip, then dipping down. These are the "spaghetti" rhododendrons and they are the most difficult plants to prune.

Taking off deadwood as noted above may be the best that can be done. If one removes the ugly branches, then the crown is just opened up to see even more remaining ugly branches. Remember that each of those pathetic whorls of leaves provide some valuable cover for the rest of the ungainly interior. In my experience, the internal branches never thicken up and look right. The best bet is to encourage the canopy to cover and hide.

That said, I sometimes do try to improve the spaghetti rhododendron a tiny bit. Here are the rules: Leave any branches that face upward and outward, no matter how horrible they seem. Then cut off the lowest hooks of what I call "serial goosenecks." As always, remove any branches that actually touch the ground. Aside from detracting from the appearance of the shrub, these ground-touching branches act as root-weevil freeways, making it easy for them to crawl up and munch on the leaves at night. Needless to say, spaghetti rhododendrons are good candidates for renovation, assuming that they have their cultural requirements met.

Powdery mildew

There is a relatively new disease ravaging the rhododendrons of the Pacific Northwest, especially Uniques and Virginia Richards. It is not the same powdery mildew commonly found on deciduous azaleas and Oregon grape. This is much worse. The symptoms do not resemble the gray powder of the other diseases, either. Instead, many of the leaves turn blotchy, yellow and sometimes brown, and fall off in the summer. (Some yellow, internal leaf drop is normal in the
late summer.) Live buds will remain on a bare stem. The shrub may grow new green leaves in the spring, but then it happens again. Rather than fight it with constant spraying with fungicides or compost "teas" (which are currently popular in some areas). I recommend removal of the ones that continually look horrible – especially if they are located in a typical home landscape setting. Botanical gardens, on the other hand, may need to combat the fungus with a regular spray program in order to save their collections. Some rhododendrons are more susceptible, and others more resistant. The disease also favors close quarters, shade and high humidity.

**Rootstock**

A final word about rhododendrons. The very first hybrids were grafted onto the roots of a vigorous species, Rhododendron ponticum. When put under stress, the rootstock grows out and new shoots from the base eventually grow up and take over the plant. (Remember this if you are contemplating a radical renovation pruning.) If your customer tells you that the shrub has two colors of blooms, this is the case. Ponticums have a purple bloom some people call fuchsia colored. The leaves are narrow and the edges are wavy. And they get very, very large. In parts of England, they have naturalized and become quite a nuisance. The arborist should know this in case the best course of action is to suggest removal. Then one can explain to the customer that it's not a special rhododendron and not even what the original designer had in mind when it was planted. On the other hand, if the customer likes it, by all means leave it. After all, there's nothing wrong with a big rhododendron.

*Cass Turnbull is the founder of PlantAmnesty in Seattle, Wash. This article was excerpted and adapted from forthcoming book on pruning for home gardeners to be published in 2003 by Sasquatch Books, www.sasquatchbooks.com.*
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Tree Termites 'Round the World

Adrian S. Juttner

Termites infestations have been documented in Japan since the 12th century, and the prominent tree-inhabiting species, *Coptotermes formosanus* (the Formosan termite), was described by Shiraki in 1907. This termite was introduced from China to Japan about 300 years ago. Even after this long period of colonization, the range of Formosan termites is limited to the littoral areas of the southern Home Islands.

In their native range of south central China, Eastern China, and the island of Taiwan, Formosan termites attack pines, leguminosae, and other trees. Though a number of species of Asian origin – notably Chinese pistachio (*Pistacia sinensis*), Goldenrain (*Koelreutheria paniculata*), Oriental arborvitae (*Thuja orientalis*), Chinaball (*Melia azaderach*), Japanese magnolia (*Magnolia soulangiana*), Japanese yew (*Podocarpus sp.*) and Japanese persimmon (*Diospyros kaki*) are demonstrably resistant to termite attacks in highly infested ground, other Chinese species – dawn redwood (*Metasequoia glyptostroboides*) and Ginkgo (*Ginkgo biloba*) – are susceptible. A group of dawn redwoods in City Park in New Orleans was infested to the point of death by dehydration and collapse.

Trade between the Kingdom of Hawaii and China flourished with sandalwood lumber being shipped out and finished wood products being shipped in. That is how the Formosan termites were introduced to the Hawaiian Islands 150 years ago. It is now found on all of the islands, but it took 100 years to cross the 105-mile channel from Oahu to Maui.

Dozens of species of tree-inhabiting termites in the British Commonwealth, including 15 species of *Coptotermes*, were described by Browne in 1968. In a 1947 paper describing fungal parasitism, Alston talked about the infestation of rubber trees in Malaysia by *Coptotermes curvignathus*. At the second International Coptotermes Symposium held in New Orleans in May 2001, Dr. Nan-Yao Su described the worldwide range of this species to be limited to 35 degrees north or south of the equator. The rapid buildup of termite
populations in areas of human habitation are more attributable to the failure of barrier-type chemical treatments than to their spread by human activity, he insists. Reunion Island is a French Overseas Department that lies off the coast of Madagascar in the Indian Ocean. Coptotermes havilandi is the main termite species inhabiting this island. It is able to inhabit and hollow out tree boles while infesting nearby homes, but its colonies are not as massive as those of C. formosanus. C. havilandi was also observed in homes and trees in urban areas of Sao Paulo, Brazil. Though the entomologists there were somewhat limited in their expertise in dendrology, they noted a Jacaranda sp. (Leguminosae) infested. Of 39 trees inspected, only four were found infested. Though C. formosanus has not yet been found in Cuba, 30 other species of termites inhabit the island, including C. havilandi.

Across the Florida straits, C. havilandi has been recently reported in the Key West area, but little information is available about its dietary preferences for our native trees.

Milner, working for the CSIRO (Australia), reported that dry conidial preparations of the fungus Metarhizium anisopliae were effective against tree colonies of Coptotermes lacteus when they were blown into tree cavities by compressed air. However, the tight, damp and mostly dung-filled colonies of C. formosanus that we encounter here in Louisiana, together with the massive underground mega-colonies connected to them, would not allow the adequate spread of an aerosolized spore suspension. Also, mortality studies conducted in jars and field trials in trees with liquid spore suspensions of this fungus have not proved very successful in New Orleans. Finally, chemical termiticides spread by foam application may be of insufficient weight and quantity to spread downwards and access enough of the mega-colony space (which may run to 70,000 gallons located 30 feet underground).

Meanwhile, in New Orleans, there has been a 70 percent drop in termite activity from a peak in 1999. This figure was established by counting alates caught in sticky traps by LSU and USDA entomologists in the French Quarter during the 2001 swarming season. We have also been observing a similar drop in tree termite activity. In 1996, half of our tree removals were infested with Formosan termites as measured by direct observation of stumps and log pieces. By early 2002, less than 5 percent of our takedowns are infested. Drill-treat activity has sunk by over 50 percent from a peak of more than 350 treatments per year. We offered a $20 bounty to other arborists for basketball- to garbage-can-sized tree termite colonies at a local compost yard and came up with only one colony per month from our competitors. Almost all clients whose trees have been treated by us have not needed re-treatment and they experienced a significant drop in swarming activity and residential damage.

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saler in the spring of 2002 revealed a significant drop in purchase. All these informal measures of termite activity point to an ongoing, precipitous collapse of the Formosan termite population in New Orleans. Termite activity on a much smaller scale is spreading out of New Orleans to the surrounding parishes of St. Charles, St. Tammany, Tangipahoa and Plaquemines. The infestation pattern seems to be following Interstate 10 east and west of the city. Alates have been trapped as far north as Columbus, Miss.

What is the significance of all of this for an arborist working up-country from south Louisiana? Though Coptotermes activity may not reach much above 35 degrees north latitude, small pockets of this pest may be seen farther north due to the effects of heated basements and global warming. I have seen infestations as far north as Memphis, Tenn. Formosan termites are distinguishable from native termites by:

- numerous soldiers with amorphous-shaped abdomens and round, brown heads. They are aggressive and will bite.
- copious swarming of alates at dusk in May and June. Also, drilling of thousands of trees in New Orleans has revealed a small but significant infestation rate by native Reticulitermes flavipes termites. Some of these tree colonies were associated with infestation of nearby homes by native termites.

The natural range of our native termite includes almost all of the continental United States and parts of Canada. Though native termite subterranean colonies are small – 500 gallons vs. 10,000 gallons for Formosans – they can be connected from tree stumps by subterranean passages to nearby homes. This fact is not lost on the residential pest control profession. Casual observation of residential sites in the course of doing estimates for tree work will often reveal the green, circular, plastic tops termite bait traps placed by applicators around trees and homes. They are trolling for termites.

If you find active termites in a tree stump cavity after a takedown, you can contribute to the cause of termite control by simply pouring a termicide into the stump hole and flushing it in with water from a garden hose. The nematode pathogen Steinernema carposcapae is available from Arbico and other dealers in biologicals. In addition, Tempo SC ultra can be diluted pretty far at low cost per stump. The commercial termicide Premise is a compound that is fairly expensive, but safe to handle and easy to purchase. Permethrin, sold under the Dragent and other labels, is an old standby. The patents on it have run out and the price is falling. You will be amazed to find that many stumps will take water at a 500-gallon-per-hour rate for one to 24 hours. This indicates that the stump hole is a portal to a huge underground termite warren. For very little extra time and labor – in that moment between the removal of a tree and the grinding of the stump – an arborist can provide an additional, priceless service to the homeowner – termite elimination.

Adrian S. Juttner is the owner of Adrian's Tree Service in New Orleans, La.
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Tour des Trees Revisited

By John Goodfellow

It has been said that unlike material possessions, ideas make one wealthy the more that they are given away. If this is true (and I believe it is!), then a number of folks associated with the Tour des Trees over these past 10 years should feel wealthy indeed. What began as a relatively simple idea has evolved to become the TREE Fund’s most significant outreach and fund-raising initiative.

“Tour des Trees” began innocently (dare I say naively) enough. Dr. Jim Clark (who, at the time, was on faculty at the University of Washington’s Center for Urban Horticulture) and I were working together on a number of urban tree issues. We both had a shared commitment to the profession and an interest in cycling. It just sort of happened: We challenged each other to ride from Seattle to the annual ISA conference in Bismarck, N.D. Things got interesting while we were at the annual conference in Philadelphia. The reaction received from friends when the idea was mentioned in casual conversation was one of overwhelming support. And oh yeah—we also realized that the following year’s conference was to be in Oakland, Calif., not Bismark. No worries; instead of heading east, we’d just cycle south down the coast. Things really got interesting when, while standing at the podium during the closing banquet, Jim announced our intent to ride. Before the function had ended, we had several folks wanting to join us. The event gained momentum and was taking on a life of its own, a characteristic of the Tour that continues today.

Reality set in that fall. What did we know about organizing a bike tour and fund-raiser? Ward Peterson was one of those who signed on early. The three of us got to work. To make a long story short, 13 riders made the commitment, a num-
ber of sponsors were landed, and a tour support company hired. Things were looking pretty good until a couple days before departure when our faith in our tour company was rocked. It became clear that they didn’t think we were going to pull it off, so they weren’t committing their resources. After some very direct phone conversations, they stepped up and assigned a very capable leader. Even then, when the first Tour rolled out of Seattle, the last two days’ route into the Bay Area was undefined. One thousand, one hundred miles and 11 days later, we crossed the Golden Gate, peddled to the ferry dock, and rolled into ISA Oakland to a hero’s welcome. By then, too, there was talk among the riders about “next year.”

The first Tour was conceived as a “quest” of sorts, a demanding trek and challenge that was as much a statement for a cause as a fund-raiser. This orientation continued over the first several tours. One hundred twenty-five-mile days were not uncommon. The extreme case came midway through Tour III: 178 miles in one day across Maine. There have been hills; the quad-burning steep pitches in the east; and the long grinds of the west. And, oh yes – the weather. The humid heat of the Carolinas, the parched heat of Nevada in August and the sauna-like heat from last year’s tour. Who would have thought it to have been a major factor in Minnesota and Wisconsin? Why mention all this? To discourage? Hardly! Rather to make the point that the Tour has become exceptionally well organized and managed. The distances and routes are now established with the goal of making the trek challenging but doable for the reasonably prepared cyclist. And the level of support provided riders while en route is outstanding, making it possible for a larger cross-section of riders to successfully participate.

As evidence of the evolution of the Tour from ultra-marathon to rigorous but achievable fund-raiser, one only has to look at the level of participation. The bakers’ dozen riders on the first Tour dwindled to a half dozen the following year. The number of riders for several years after that fluctuated between 30 and 50. More recently, the number of participating cyclist has been crowding 100.

Since its inception, about 366 riders have pedaled more than 6,000 miles, raising $1.7 million for tree-related research. They have passed through hundreds of cities and towns, interacting with countless people, raising awareness and spreading the message that trees in our communities are important.

Why do they do it? Why do they commit to a tough week on a bike, and in many ways an even more significant commitment to training and fund-raising? People have done it with less preparation, but my recommendation would be to have 1,500 miles riding on your butt before you begin. Each rider is also responsible for raising $3,000 in donations and many significantly exceed this level of fund-raising. Yes, of course folks sign on for the sport or recreational experience as well as the obvious benefit of fitness. But motivations far beyond these direct benefits are the norm. We arborists are an idealistic lot, and Tour riders tend to be among the most passionate of us. Ask any rider about his or her experience, and what comes back more often has to do more with the relationships forged on the ride than the ride or cause. Within a day or so of being on the road, the reality of one’s daily life slips away into the distance and, for at least a little while, it’s all about the community of riders and what is to be accomplished. The relationships forged on the Tour are without a doubt one of the most profound benefits of riding. The high number of repeat riders is evidence of this fact.

Finally, but not least, is the sense of fulfillment and self-actualization a rider achieves in riding for something we all believe in. What a great opportunity to give something back to our common cause and profession.

The 2002 edition of Tour des Trees is fast approaching. This year’s Tour has the potential to be one of the best. The route essentially circumnavigates Puget Sound and the San Juan Islands. Spectacular scenery abounds, and the Pacific Northwest’s “Mediterranean climate” is known for cool dry summers. Finally there is the sentimental aspect of the Tour returning to Seattle after 10 years. On day five, this year’s riders will cross the outbound track of Tour I and, in effect, bring the Tour full circle.

The future of Tour des Trees is bright. It will continue to evolve and touch new people. It has momentum and a life of its own. If you ever thought of riding, make the commitment to do so; you will not be disappointed. If you have ridden a previous Tour, chances are you’ll be back again. The event has that kind of effect on everyone it touches.
China Begins Massive Reforestation Effort

Chinese officials are tackling the increasing problems of expanding deserts, chronic droughts and deadly flooding by instituting a $10 billion, 10-year reforestation program. The goal is to plant 170,000 square miles of trees – an area approximately the size of California.

According to a report by The Associated Press, wholesale logging over many decades has turned the country into somewhat of a desert wasteland, and smaller tree-planting programs have not accomplished enough, according to Lei Jiafu, deputy administrator of the State Administration of Forestry.

"China has not fundamentally reversed the trend of a deteriorating ecosystem," Lei said in announcing the project.

One of the problems facing this endeavor is finding the trees to plant. Although China has a successful tree-farming industry, there may not be enough trees for the project.

Trees Transplanted for Airport Construction

Florida’s Broward County Aviation Department is working with Cummings-Centex Rooney – a joint venture of two prominent South Florida builders – to move more than 500 trees to locations throughout the county to improve Broward’s tree canopy.

Fort Lauderdale/Hollywood International Airport’s newest expansion project and Broward County’s largest Construction Management at Risk project – the Consolidated Car Rental Facility – required the relocation of approximately 300 trees during April to make room for construction and to enhance Broward County parks. Toward the end of the construction schedule, Cummings-Centex Rooney will install new trees as part of the new parking garage’s landscaping plan.

Broward’s Urban Forest Initiative encourages public and private efforts to preserve and increase tree canopy. American Forests recommends a 40 percent tree canopy for urban areas; in 1996 Broward County’s tree canopy covered only 13 percent of the county.

Pesticide Link to Frog Deformity Questioned

Recent studies into the cause of frog deformities in the western United States originally pointed to pesticides as the likely cause, but conclusive research has linked the deformities to a parasitic flatworm as the culprit.

A study published in the May issue of Ecological Monographs, the journal of the Ecological Society of America, states that existing laboratory studies show that the trematode known as Ribeiroia ondatrae can cause the frogs to sprout extra legs.

Pesticide users who also use fertilizers aren’t entirely off the hook however; it appears that a chain reaction involving fertilizer (including cow manure) is partly to blame for the malformations. According to The Associated Press, fertilizer washing into ponds may contribute to the problem.

“We think the fertilizer is causing more algae,” according to Andrew Blaustein, professor of zoology at Oregon State University and one of the study’s authors.

“More algae means more snails to eat the algae,” Blaustein told The Associated Press. “More snails means more parasites (because they live in the snails). More parasites means more malformed frogs.”

Storm Wins Battle Against Oldest US Oak

The life of a 460-year-old Wye Oak in Maryland ended in June when winds from a violent thunderstorm toppled it.

The huge tree - which measured about 100 feet tall and 31 feet in circumference - was also the National Champion white oak. It was the largest of its species in the United States.

It was found after the storm on Route 662 in Wye Mills, Talbot County, Md.

The sight of the fallen tree was emotional for residents and visitors alike.

“It’s like a little piece of everybody’s life went down with it,” Gail Dadds, who grew up less than a mile away from the tree, told the Baltimore Sun.

The tree’s memory will live on, however: Two years ago, Frank Gouin, a former chairman of the horticulture department at the University of Maryland, produced the first successful clones of the tree. One of those clones is scheduled to be planted in the same park where the centuries-old tree fell.

EPA-Approved Pesticide No Use in Frog Fight

A plethora of frogs has been serving up sleepless nights for many locals and tourists in Hawaii recently.

The coqui call (a loud ko-KEE) - which can measure 90 decibels, or about the sound level of a lawn mower - has been making a racket, according to an article in the Washington Post, and there's little anybody can do about it. The only EPA-approved pesticide to control the frogs has been causing considerable harm. The caffeine-containing substance has been causing the frogs to "freak out" as if they had heart attacks, according to agents.
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From the Field

The Pretender Survives

By John Keslick

Here is a true story that may start you thinking. I started working with trees in 1986. Three years later I started my own business, Keslick's Tree Service, in Bradenton, Fla.

I was far from an expert. I offered to purchase climbing gear — if the salesman would show me how to tie off. A friend who worked for a company that pruned near powerlines brought me in for a side job and taught me how to climb and use ropes to lower limbs. I really didn’t do any work near energized lines, however.

Those early lessons from people in the field prompted me to continue learning — from books and from people. In 1991, I bought the book Modern Arboriculture by Dr. Alex L. Shigo, and started attending seminars. When I moved my company to West Chester, Pa., I renamed it Keslick and Son Modern Arboriculture.

I joined the National Arborist Association, and spent a lot of time on the phone with the NAA's staff arborist, Brian Barnard. He helped me with issues such as topping, and, like a sponsor, helped me to help customers make the right choices.

I dove into the NAA’s Professional Home Study courses to learn more. Before I completed the section on "Working Near Utility Lines," however, I found myself involved with a task that involved energized lines. A local bank was expanding and changing the landscape. We were hired to remove several trees as well as prune trees along the property line. A visual assessment revealed a transformer involved with a tree and vines. The energy provider was notified and we stayed clear of the transformer.

Instead of standing around waiting for the utility people to arrive, we began to prune a fairly young tulip poplar on the property. Before I entered the tree, I noticed a cable running parallel to the ground. Out of ignorance, I identified the wire as a guy wire holding up the poles. I said to my brother, who was working with me, “Let’s pretend this wire is energized. This will help us get ready for working near energized lines.”

We did our best not to come indirectly or directly in contact with the cable, which was within 10 feet of the trunk. I could have reached out and touched the line at any time. When PECO Energy arrived, the technician informed us that the cable was a 40,000 volt primary line, supplying most of the nearby community with power!

I’ve learned a few things in my 16 years in the profession:

- always be on the lookout for cracks;
- trees don’t have root flares — they have trunk flares;
- you could have a trunk flare and no woody roots for support;
- sprouts do not have branch collars;
- the symplast conducts electricity 365 days a year;
- Spikes creates wounds to symplast and conduct electricity;
- Low branches on trees near lines can give children access to contact lines;
- All lines should be considered energized.

Take some courses or one of Shigo’s Tree Autopsy and Dissection labs. Even if you don’t normally work near utility lines, take a course so you’ll know what you don’t know.

It might save your life.

Do you have a story From the Field?

TCI will pay $100 for published articles. Submissions become the property of TCI and are subject to editing for grammar, style and length. Entries must include the name of a company and a contact person.
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Hoover Tree Experts, Kenner, LA
Tujack Hoover
“We have Bandit, Morbark, and Vermeer brush chippers and we use Zenith knives on all of our chippers. For over 4 years now Zenith has been our knife of choice. We’ve tried other knives but we always come back to Zenith because of the good quality and delivery”

Trabucchi Tree Service, Chester, CT
Roger Trabucchi
“... Then I ordered from your Company and received the blades individually wrapped, and packed tightly with cardboard. I will never order from another source again! Keep up the excellent work.”

Barfield Enterprises, Spartanburg, SC
Arnold Barfield
“Dear Zenith;
I am not sure what the difference is between the blades your company makes and the original ones are. All I do know is that when I changed blades, there was a big difference in the performance of my chipper. The blades lasted much longer. I would say they lasted three times longer before needing to be sharpened. The blades I ordered from you, make my chipper run better and longer between sharpening.”

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Chris Vanderhoef
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Stihl’s protective wear complies with OSHA regulations. STIHL offers an excellent selection of ProMark™ protective apparel that is washable, comfortable, lightweight and complies with OSHA Reg. 1910.266 requirements for personal protective equipment. UL® classified protective chaps are made with durable Cordura® nylon and feature pads with six or nine layers of Engtex® cut-retardant material. The protective chaps are offered in a variety of sizes and styles. The STIHL ProMark™ line of protective apparel includes safety glasses, helmet systems, ear muffs, chain saw protective chaps, pants, denim leggings, shirts, gloves, and chain saw protective boots. For more information or for the name of the closest STIHL retailer, call toll free 1-800-G0 STIHL (1-800-467-8445) or visit their Web site at www.stihlusa.com.

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Variety and availability of quality arborist supplies are at your fingertips. We’ve got the “right stuff.” Whether the job is big or small, supplying your needs is our goal. Phone orders are shipped the day they are received. If we don’t have an item, we will find it! Call for your free catalog. Western Tree Equipment & Repairs, 11530-B Elks Circle, Rancho Cordova, CA 95742-7357. Phone: 1-800-94-ARBOR (942-7267); Fax: (916) 852-5800.

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Bandit’s Chipper/Chip Box Combo eliminates the need for a separate chip truck, and related costs such as insurance, licensing, etc., is available with Bandit’s Model 65 (6-inch diameter capacity) or Model 90XP (9-inch diameter capacity). Combo unit features an 8.5 cubic yard dump box with hydraulic lift. Chipper is mounted on a turntable. Seven different chipping positions are provided and can be changed in a matter of seconds. For further information, contact Bandit Industries, Inc., 6750 Millbrook Road, Remus, MI 49340. Phone: 1-800-952-0178; Fax: (989) 561-2273; E-mail: brushbandit@eclipsetel; or visit online at www.banditchippers.com.

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DYNAMIC MANUFACTURING COMPANY

Dynamic Manufacturing of Weidman, Mich., introduces its new line of Cone-Head™ brush chippers. The advanced design (patent pending) of the Cone-Head™ chipper makes this chipper far ahead of conventional discs and drums. Achieve greater efficiency in use of horsepower and fuel economy per dollar spent. The Cone-Head™ chipper has the widest openings in the industry in all model sizes. This allows for faster feed rates and fewer clogs caused by crooked limbs and crotches. Many models available to suit your needs in both horsepower and opening sizes. Call (989) 644-8109, or visit www.pik-n-pak.com.

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KARL KUEMMERLING, INC.

Manufacturer of Mitts & Merrill Brush chippers - 8" capacity, Drum or Hydraulic Feed roll, gas or diesel. Make small chips (excellent for mulch) that pack together on truck resulting in fewer loads to dump. Also Timberwolf Wood Splitters & Conveyors, Swinger Loaders, John Bean Sprayers, Husky and Homelite Chain Saws. Plus full line of Arborist Supplies (ropes, saddles, saws, etc.) & Outdoor Work Clothing & Boots. Free Catalog: Karl Kuemmerling Inc., 129 Edgewater Ave., NW, Massillon, OH 44646, 1-800-464-8227; Fax: (330) 477-8528; E-mail: kuemmerling@ezo.net; Web: www.karlkuemmerling.com.

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MORBARK, INC.

Available with loader, the 2400XL is even more versatile, offering tree care professionals an affordable machine that can be used both as a loader-fed and a hand-fed chipper. The proven Mor-Lift Model 150 hydraulic knuckle-boom loader is a real labor-saving option. This versatile 18-inch diameter chipper is an efficient recycler of large wood waste material, including brush, logging slash and orchard prunings. This chipper packs plenty of power with either a 250 hp John Deere or 260 hp Cummins engine. Call your local Morbark dealer for a demonstration of the Model 2400XL Hurricane with loader, or contact Morbark directly at 1-800-831-0042.

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TRELAN MANUFACTURING

Trelan Chippers have been in production for nearly 30 years, serving the whole tree market for paper and fuel chip producers. The chipper technology developed over that time is now available to the arborist industry, as five brush chipper models will be developed and introduced in 2002. Designed with the same features as Trelan's large models, the Model 8000 pictured is designed to fill the need of tree contractors needing to dispose of material with a maximum diameter of 18" and lot clearing contractors requiring a compact chipper with heavy-duty capability. The 8000 is available with a loader, winch or remote control. Trelan Manufacturing, 498 Eight Mile Road, Remus, MI 49340; Phone: (989) 561-2280; E-mail: trelan@trelan.com; Web: www.trelan.com.

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Vermeer introduces the BC1400, a 122 HP (91 kw) brush chipper featuring enhanced safety and productivity. The BC1400 comes standard with the patent-pending SmartFeed™ system and an innovative bottom feed stop bar with two "sensitivity" settings. And, an eight-position, adjustable feed roller tension system allows the operator to easily set tension on the feed rollers to match the type of material being chipped. For more information, or to find your local Vermeer dealer, visit www.vermeer.com or call 1-888-VER-MEER (837-6337).

Industrial-quality chipper knives to precise OEM specifications. Zenith chipper knives are manufactured from the same high-quality materials as the cutters Zenith provides to the corrugated, plastic and tire recycling industries. Zenith chipper knives give you more chipping performance because they hold their edge and stand up to repeated sharpenings! Guaranteed to be your best value, these quality industrial knives are available for shipment within 24 hours of your order. Zenith Cutter Co., 5200 Zenith Parkway, Loves Park, IL 61111. Phone: 1-800-223-5202 or (815) 282-5200; Fax: (815) 282-5232; Web: www.zenithcutter.com.

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INTERNATIONAL SOCIETY OF ARBORICULTURE

The International Society of Arboriculture keeps its members informed of the latest practical and scientific information through the Journal of Arboriculture and Arborist News. Members receive each publication six times per year. In addition, members are entitled to discounts on more than 100 different publications, videos, and other membership items. To become a member, call ISA; annual membership is $105. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826-3129. Phone: 1-888-ISA-TREE (472-8733) or (217) 355-9411; Fax: (217) 355-9516; E-mail: isa@isa-arbor.com; Web: www.isa-arbor.com.

NAA - EHAP

Knowing the proper techniques to use when an electrical hazard exists is crucial for all treeworkers, even if the only hazards your employees face are in your client’s back yard! The newly revised Electrical Hazards Awareness Program (EHAP) gives your employees the knowledge they need to help prevent accidents and includes changes to be consistent with the new ANSI Z133.1-2000 standard. Employees study the six sessions and, after each session, take a test graded by the NAA. NAA helps employers with training documentation by maintaining test results in an NAA database and providing forms for employee verification of Basic First Aid/CPR training, practice aerial rescue, and viewing of the Aerial Rescue and Electrical Hazards and Trees videos. National Arborist Association, 3 Perimeter Road, Unit 1, Manchester NH 03103. Phone: 1-800-733-2622, Fax: (603) 314-5386; Web: www.natlarb.com.

NAA - TAILGATE SAFETY

When you absolutely must conduct safety training with limited time disruption, the NAA’s Tailgate Safety Program is the program for you. Tailgate training is a brief, informal and informative lesson given at a job site. It generally involves some simple props and may be geared to the job of the day. Although it requires only a small amount of time, tailgate training has proven to be highly effective. Additionally, because OSHA requires employers to document that they provide safety training, the NAA Tailgate Safety Program provides for training documentation. The 2002 edition features 70 sessions covering workplace scenarios likely to cause harm. Use the test results for OSHA safety training documentation. National Arborist Association, 3 Perimeter Road, Unit 1, Manchester NH 03103, Phone: 1-800-733-2622, Fax: (603) 314-5386; Web: www.natlarb.com.

NAA - TREEWORKER

The NAA’s TreeWorker newsletter is for field employees of tree care companies. Each colorful issue gives employees “how-to” pointers on subjects such as improving client relations and avoiding vehicular accidents. Special features on disease and pest alerts, tree identification or technical features appear in many issues. Those often-hilarious, always informative Mr. Safety cartoons, created by the tree care industry’s own Brian Kotwica, are on the back cover. Many arborists use each issue as a monthly safety tailgate training session. To subscribe, call the NAA at 1-800-733-2622 or (603) 314-5380; Fax: (603) 314-5386; or visit on the Web at www.natlarb.com.
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Here's a PTO clutch designed for the Arbor industry - specifically wood chipper applications. Our product is manufactured using current heavy-duty truck components. We are so confident that this will be the most durable clutch you will ever use, we are offering as standard, a two-year warranty - a first in the industrial marketplace. AutoClutch Manufacturing, 655 Wheat Lane, Wood Dale, IL 60191. Phone Toll-Free: 1-800-551-2938; Fax: 1-800-432-9745; www.autoclutch.com.

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We help thousands of people all over America achieve their entrepreneurial dreams. We listen to people, we don't make decisions with computers or models. We work with you to develop custom payment plans to fit your budget. We have the ability to finance you through a private seller or dealer. We can finance older trucks for longer terms. Are you thinking of starting your own business and not sure if you qualify? Are you looking to expand your business? Does your bank understand? C. A. G. understands - call today for your pre-approval! C. A. G. Corporation, 10 Hillman Drive, Suite 104, Chadds Ford, PA 19317. Call Toll-Free: 1-800-932-CASH (2274); Fax: 610-558-1949; Web: www.cagcorp.com.

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Fanno Saw Works continues its reputation of offering tree care professionals quality and unique tools through the Fanno International name. The FI-131 Tri-Edge hand saw offers its user the most durable saw of its type on the market. Fanno Saw Works, PO Box 628, Chico, CA 95927. Phone: (530) 895-1762; Fax: (530) 895-0302; Web: www.fannosaw.com.

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Model shown features stainless steel tank and decks with dry storage built in. Includes split compartment tank with 40 GPM, PTO drive pump and multiple hose reels. 2002 catalog (over 150 pages) available free to NAA Members. Minnesota Wanner Company, 5145 Eden Ave. South, Minneapolis, MN 55436.

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Labor-saving, economical, strong. Those are the benefits you get when you use the TREE-CROTCHTM Grip to reinforce the crotch of a tree, and what you can expect from the TREE-GRIPTM Dead-End for tree cabling installation. Both the TREE-CROTCHTM Grip and the TREE-GRIPTM Dead-End use the proven helical concept to grip strand. The helical method ensures that the Published Rated Breaking Strength of the strand is achieved. Installation time is greatly reduced, saving time and labor cost. Preformed Line Products, PO Box 91129, Cleveland, OH 44101. Phone: (440) 461-5200; Web: www.preformed.com.

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For arborists everywhere: Super-tough polyethylene drive-on matting system for easy accessibility over lawns and grounds that need to be protected. Also available - economical and durable outrigger pads. Call for order information. Alturnamats, Inc., PO Box 344, Titusville, PA 16354. Phone Toll-Free: 1-888-544-6287; Fax: (814) 827-2903; Web: www.alturnamats.com.

**ARBORTECH**

For over 15 years, Arbortech has been one of the nation’s leading manufacturers of forestry bodies and arboriculture products. The Arbortech produce line includes chip bodies, crew cabs, utility tree vehicles and toolboxes. Arbortech, 3203 West Old Lincoln Way, Wooster, OH 44691. Phone: 1-800-255-5715; Fax: (330) 264-0891 Web: www.arbortech.cc.
trucks & truck accessories

ROYAL TRUCK & EQUIPMENT INC.

SCHODORF TRUCK BODY & EQUIPMENT COMPANY
“Silver Knight” forestry bodies with “Dust Release System,” lengths from 9 feet to 18 feet. Very popular options include aluminum removable roofs, liftgates and cranes. We will build a forestry body for you the way you want it built. Ask the man who owns one!! For a free brochure/quote, contact Mike Cassidy. Schodorf Truck Body & Equipment Company, 885 Harmon Ave., Columbus, OH 43223. Phone: 1-800-288-0992; E-mail: forestry@schodorftruck.com; Web: www.schodorftruck.com.

Please circle 173 on Reader Service Card

wood processors

B&B MANUFACTURING
Sell your wood at $300 per cord or more. Double or triple your profits by shrink wrapping wastewood or firewood with WOOD-PAKer! Attractive, various-sized packages can be obtained with our high-production, easily operated and affordable machines. Seven machines available. Inquire for free details. Video and package samples at nominal fee. B&B Manufacturing, 3007 West River Road, Olean, NY 14760. Phone: 1-800-654-5320; E-mail: bbmfg@sprynet.com; Web: home.sprynet.com/~bbmfg/

BANDIT INDUSTRIES, INC.
This unit from Bandit quarters logs and stumps in a single pass so they can be easily processed by a chipper or grinder. Rids stumps of rock and dirt, reducing maintenance costs to chippers and grinders. This machine is able to tackle materials of almost unlimited diameter and easily handles 106-inch long logs. For further information, contact Bandit Industries, Inc., 6750 Millbrook Road, Remus, MI 49340. Phone: 1-800-952-0178; Fax: (989) 561-2273; E-mail: brush-bandit@eclipsetel.com; Web: www.brushbandit.com.

Please circle 175 on Reader Service Card
FECON, INC.

Fecon develops profitable solutions in the recovery and re-use of wood and organic materials with a full range of resource recovery equipment and systems. Product lines include Horizontal Grinders, Satellite Screens®, FECON Mulch Coloring Systems®, the Bull Hog® wood shredder and specialty attachments for reforestation and remediation. FECON, Inc. 10350 Evendale Drive, Cincinnati, OH 45241; Phone: 1-800-528-3113; Fax: (513) 956-5701; E-mail: Fecon@fuse.net; Web: www.fecon.com.

TIMBERWOLF MANUFACTURING CORP.

Timberwolf processors give a single operator the ability to process firewood from the safety and comfort of the operator’s station at a rate of 1 1/2 to 3 1/2 cords an hour. Exclusive fast-clamping top-roll technology rolls over crooked logs and holds tight where others lose their grip. Commercial cylinders with oversized shafts mean top speed and splitting power. Call 1-800-340-4386 for FREE information on our complete solutions for wood processing. TIMBERWOLF, 118 Spruce St, Rutland, VT 05701. Web: www.timberwolfcorp.com; E-mail: phincks@timberwolfcorp.com or kfarley@timberwolfcorp.com
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Adjuvants/Miscellaneous Chemicals
American Arborist Supplies Inc.
Ben Meadows Company
ESSCO Distributors Inc.
Midwest Arborist Supplies
Professional Tree Surgeon Supplies
Sherrill Arborist Supply

Aerial Lifts
Aerial Lift, Inc.
CUES, Inc.
G&A Equipment, Inc.
MAT-3, Inc.
Mickey's Truck & Equipment Sales
MIRK, Inc./Toombs Truck & Equip.
NESCO, Inc.
Opydike, Inc.
Sherrill Arborist Supply
Southeastern Equipment Company
Specialized Hydraulics, Inc.
Thayer Chevrolet Toyota - Great Lakes Ford Nissan
Trueco, Inc.

Aerial Lifts - Parts & Equipment
Aerial Equipment, LLC
Aerial Lift, Inc.
Alliance Equipment Company, Inc.
CUES, Inc.
MAT-3, Inc.
Mickey's Truck & Equipment Sales
Midwest Arborist Supplies
MIRK, Inc./Toombs Truck & Equip.
NESCO, Inc.
Sherrill Arborist Supply
Specialized Hydraulics, Inc.
Tree Line Supply Co.
Trueco, Inc.

Augers - Earth & Bits
American Arborist Supplies Inc.
Bailey's
Ben Meadows Company
CUES, Inc.

ESSCO Distributors Inc.
Forestry Suppliers, Inc.
J. P. Fuller Inc.
Karl Kuemmerling, Inc.
Midwest Arborist Supplies
MIRK, Inc./Toombs Truck & Equip.
NESCO, Inc.
Professional Tree Surgeon Supplies
Sherrill Arborist Supply
Tree Tools

Bioinsecticides
American Arborist Supplies Inc.
Arborjet, Inc.
ESSCO Distributors Inc.
Midwest Arborist Supplies
Professional Tree Surgeon Supplies
Sherrill Arborist Supply

Biopesticides
Arborjet, Inc.
ESSCO Distributors Inc.
Professional Tree Surgeon Supplies
Sherrill Arborist Supply

Blowers, Debris
American Arborist Supplies Inc.
Ben Meadows Company
Bishop Company
Blue Ridge Arborist Supply
Cleaves Company, Inc.
ESSCO Distributors Inc.
J. P. Fuller Inc.
Tree Tools
Western Tree Equipment & Repair

Cabling & Bracing
Alexander Equipment Co. Inc.
American Arborist Supplies Inc.
American Chainsaws & 2 Cycle, Inc
Bailey's
Bartlett Manufacturing Company
Berkshire Products, Inc.
Bishop Company
Blue Ridge Arborist Supply
Cleaves Company, Inc.
ESSCO Distributors Inc.
Fehr Bros. Industries, Inc.
J. P. Fuller Inc.
Growtech, Inc.
Karl Kuemmerling, Inc.
Kramer Equipment Co., Inc.
Midwest Arborist Supplies
Northeastern Arborist Supply
Professional Tree Surgeon Supplies
Shelter Tree, Inc./Tree Care Products
Sherrill Arborist Supply
Tree Line Supply Co.
Tree Tools
Western Tree Equipment & Repair

Chain Saws & Accessories
ADI Pruning Tools by TOL Inc.
Aerial Equipment, LLC
Alexander Equipment Co. Inc.
Alliance Equipment Company, Inc.
American Arborist Supplies Inc.
American Chainsaws & 2 Cycle, Inc
Arbor Direct, LLC
Bailey's
Bishop Company
Blue Ridge Arborist Supply
Cleaves Company, Inc.
Commercial Cutters Direct
Cutter's Choice
ESSCO Distributors Inc.
J. P. Fuller Inc.
Growtech, Inc.
Hollie Wood Enterprises
Karl Kuemmerling, Inc.
Midwest Arborist Supplies
NESCO, Inc.
Northeastern Arborist Supply
Professional Tree Surgeon Supplies
Shelter Tree, Inc./Tree Care Products
Sherrill Arborist Supply
Tilton Equipment Co c/o Jonsered/EFCO
Tree Line Supply Co.
Tree Tools
Western Tree Equipment & Repair
Distributors (cont.) …

**Chemical Absorbants**
- American Arborist Supplies Inc.
- ESSCO Distributors Inc.
- Professional Tree Surgeon Supplies

**Chippers**
- Aerial Equipment, LLC
- Alexander Equipment Co. Inc.
- Blue Ridge Arborist Supply
- The Cat Rental Store
- Cleaves Company, Inc.
- Crane & Shovel Sales Corp.
- Droege Equipment Inc.
- ESSCO Distributors Inc.
- G&A Equipment, Inc.
- Karl Kuemmerling, Inc.
- Mickey’s Truck & Equipment Sales
- NESCO, Inc.
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Southeastern Equipment Company
- Tree Tools
- Trelan Manufacturing
- Trueco, Inc.
- WesSpur, LLC
- Western Tree Equipment & Repair

**Chippers/Shredder/Vac**
- Blue Ridge Arborist Supply
- G&A Equipment, Inc.
- Tree Tools
- WesSpur, LLC
- Western Tree Equipment & Repair

**Climbing Gear**
- Aerial Equipment, LLC
- Alexander Equipment Co. Inc.
- American Arborist Supplies Inc.
- American Chainsaws & 2 Cycle, Inc.
- Arbor Direct, LLC
- Bailey’s
- Bartlett Manufacturing Company
- Bashlin Industries, Inc.
- Ben Meadows Company
- Bishop Company
- Blue Ridge Arborist Supply
- Buckingham Manufacturing Co., Inc.
- Cleaves Company, Inc.
- Climb Axe, Ltd.
- Cutter’s Choice
- Droege Equipment Inc.
- ESSCO Distributors Inc.
- Forestry Suppliers, Inc.
- J. P. Fuller Inc.
- Growtech, Inc.
- Hollie Wood Enterprises
- Karl Kuemmerling, Inc.
- Kramer Equipment Co., Inc.
- Midwest Arborist Supplies
- Northeast Arborist Supply
- Petzl America
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Line Supply Co.
- Tree Tools
- WesSpur, LLC
- Western Tree Equipment & Repair

**Clothing**
- American Chainsaws & 2 Cycle, Inc.
- Bailey’s
- Bartlett Manufacturing Company
- Ben Meadows Company
- Bishop Company
- Blue Ridge Arborist Supply
- Cleaves Company, Inc.
- Commercial Cutters Direct
- Growtech, Inc.
- Karl Kuemmerling, Inc.
- Midwest Arborist Supplies
- Professional Tree Surgeon Supplies
- Sherrill Arborist Supply
- Tree Line Supply Co.
- Tree Tools
- WesSpur, LLC
- Western Tree Equipment & Repair

**Communication Systems**
- American Arborist Supplies Inc.
- Arbor Computer Systems
- Sherrill Arborist Supply
- Tree Line Supply Co.
- Tree Tools

**Composting Equipment**
- Cleaves Company, Inc.

**Computer Hardware/Software**
- Arbor Computer Systems
- Creative Automation Solutions/ArborSoftWorx
- Tree Management Systems, Inc.

**Cranes**
- Crane & Shovel Sales Corp.
- CUES, Inc.
- Mickey’s Truck & Equipment Sales
- MIRK, Inc./Toombs Truck & Equip.
- NESCO, Inc.
- Royal Truck & Equipment, Inc.
- Southeastern Equipment Company
- V&H Inc.

**Diagnostic Tools**
- American Arborist Supplies Inc.
- Bishop Company
- Concept Engineering Group, Inc.
- IML - Instrument Mechanic Labor
- Midwest Arborist Supplies
- Tree Line Supply Co.
- Tree Tools
- WesSpur, LLC

**Education/Workshop/Reference**
- American Arborist Supplies Inc.

**Engines & Engine Parts**
- Aerial Equipment, LLC
- American Arborist Supplies Inc.
- Auto Manufacturing, Inc.
- Capital Engine Co.
- Cleaves Company, Inc.
- Commercial Cutters Direct
- Cummins Michigan, Inc.
- Engine Center
- ESSCO Distributors Inc.
- McDonald Equipment Company (MECO)
- Perkins Power Corporation
- Power Great Lakes, Inc.
- Sherrill Arborist Supply
- Southeastern Equipment Company
- Superior Diesel Inc.
- Tree Tools

**Excavators**
- Cleaves Company, Inc.
- NESCO, Inc.
- Rayco Manufacturing, Inc.

**Fertilization Supplies**
- American Arborist Supplies Inc.
- Arborjet, Inc.
- Ben Meadows Company
- Bishop Company
- Cleaves Company, Inc.
- Forestry Suppliers, Inc.
- Midwest Arborist Supplies
- Northeast Shade Tree
- Professional Tree Surgeon Supplies
- ROOTWELL Inc.
- Sherrill Arborist Supply
- Tree Line Supply Co.
**Distributors (cont.) ...**

**Fertilization/Aeration Equipment**
- American Arborist Supplies Inc.
- Ben Meadows Company
- Cleaves Company, Inc.
- Concept Engineering Group, Inc.
- J. P. Fuller Inc.
- Midwest Arborist Supplies
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Line Supply Co.

**Generators**
- Ben Meadows Company
- Capital Engine Co.
- Cleaves Company, Inc.
- CUES, Inc.
- Engineer Center
- J. P. Fuller Inc.
- McDonald Equipment Company (MECO)
- NESCO, Inc.
- Northeast Arborist Supply

**Grapples/Loaders**
- Crane & Shovel Sales Corp.
- Growtech, Inc.
- NESCO, Inc.
- Payeur Distributions Inc.
- Royal Truck & Equipment, Inc.
- Southeastern Equipment Company
- V&H Inc.

**Growth Retardants/Regulators**
- American Arborist Supplies Inc.
- Arborjet, Inc.
- Midwest Arborist Supplies
- Sherrill Arborist Supply

**Herbicides**
- American Arborist Supplies Inc.
- Arborjet, Inc.
- Ben Meadows Company
- Forestry Suppliers, Inc.
- Midwest Arborist Supplies

**Hydraulic Tools & Equipment**
- ADI Pruning Tools by TOL Inc.
- Aerial Lift, Inc.
- American Arborist Supplies Inc.
- Bishop Company
- CUES, Inc.
- FCI-Racine Hydraulic Tools
- Karl Kuemmerling, Inc.
- Midwest Arborist Supplies
- NESCO, Inc.
- Professional Tree Surgeon Supplies
- Southeastern Equipment Company
- V&H Inc.
- WesSpur, LLC
- Western Tree Equipment & Repair

**Insecticides**
- American Arborist Supplies Inc.
- Arborjet, Inc.
- ESSCO Distributors Inc.
- Midwest Arborist Supplies
- Sherrill Arborist Supply

**Integrated Pest Management**
- American Arborist Supplies Inc.
- Arbor Computer Systems
- ESSCO Distributors Inc.
- Professional Tree Surgeon Supplies
- Tree Line Supply Co.

**Irrigation/Aeration Products**
- Ben Meadows Company
- Midwest Arborist Supplies
- ROOTWELL Inc.
- Sherrill Arborist Supply

**Knives, Chippers**
- Aerial Equipment, LLC
- Alexander Equipment Co. Inc.
- American Arborist Supplies Inc.
- Blue Ridge Arborist Supply
- Cleaves Company, Inc.
- Crane & Shovel Sales Corp.
- CUES, Inc.
- Droge Equipment Inc.
- ESSCO Distributors Inc.
- Growtech, Inc.
- Hollie Wood Enterprises
- Karl Kuemmerling, Inc.
- Leonardi Manufacturing Co.
- Midwest Arborist Supplies
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Line Supply Co.
- Tree Tools
- Trelan Manufacturing
- WesSpur, LLC
- Western Tree Equipment & Repair

**Knives, Chippers - Repair**
- Aerial Equipment, LLC
- Alexander Equipment Co. Inc.
- American Arborist Supplies Inc.
- Blue Ridge Arborist Supply
- Cleaves Company, Inc.
- CUES, Inc.
- Droge Equipment Inc.
- ESSCO Distributors Inc.
- Karl Kuemmerling, Inc.
- Leonardi Manufacturing Co.
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Tools
- WesSpur, LLC

**Fungicides**
- American Arborist Supplies Inc.
- Arborjet, Inc.
- ESSCO Distributors Inc.
- Midwest Arborist Supplies
- Professional Tree Surgeon Supplies
- Sherrill Arborist Supply

**Footwear**
- Bailey's
- Bishop Company
- Blue Ridge Arborist Supply
- Commercial Cutters Direct
- Forestry Suppliers, Inc.
- Growtech, Inc.
- Karl Kuemmerling, Inc.
- Midwest Arborist Supplies
- Sherrill Arborist Supply
- Tilton Equipment Co c/o Jonsered/EFCO

**General Arborist Supplies**
- Aerial Equipment, LLC
- Ahlborn Equipment, Inc.
- Alexander Equipment Co. Inc.
- American Arborist Supplies Inc.
- American Chainsaws & 2 Cycle, Inc.
- Arbor Direct, LLC
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- Berkshire Products, Inc.
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- Commercial Cutters Direct
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- Hollie Wood Enterprises
- Karl Kuemmerling, Inc.
- Kramer Equipment Co., Inc.
- Midwest Arborist Supplies
- Professional Tree Surgeon Supplies
- ROOTWELL Inc.
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply

**Herbicides**
- American Arborist Supplies Inc.
- Arborjet, Inc.
- Ben Meadows Company
- Forestry Suppliers, Inc.
- Midwest Arborist Supplies

**Hydraulic Tools & Equipment**
- ADI Pruning Tools by TOL Inc.
- Aerial Lift, Inc.
- American Arborist Supplies Inc.
- Bishop Company
- CUES, Inc.
- FCI-Racine Hydraulic Tools
- Karl Kuemmerling, Inc.
- Midwest Arborist Supplies
- NESCO, Inc.
- Professional Tree Surgeon Supplies
- Southeastern Equipment Company
- V&H Inc.
- WesSpur, LLC
- Western Tree Equipment & Repair

**Insecticides**
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- Arborjet, Inc.
- ESSCO Distributors Inc.
- Midwest Arborist Supplies
- Sherrill Arborist Supply
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Cleaves Company, Inc.  
Karl Kuemmerling, Inc.  
Kramer Equipment Co., Inc.  
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Tree Tools  

Lawn Maintenance Equipment  
American Chainsaws & 2 Cycle, Inc.  
Ben Meadows Company  
Blue Ridge Arborist Supply  
Commercial Cutters Direct  
Concept Engineering Group, Inc.  
ESSCO Distributors Inc.  
J. P. Fuller Inc.  
Karl Kuemmerling, Inc.  
Tree Tools  
WesSpur, LLC  

Lightning Protection Systems  
American Arborist Supplies Inc.  
CUES, Inc.  
Independent Protection Company  
Northeastern Arborist Supply  
Tree Tools  

Lubricants  
Arbor Direct, LLC  
ESSCO Distributors Inc.  
Fehr Bros. Industries, Inc.  
Growtech, Inc.  
Tree Tools  

Macroinfusion Supplies  
American Arborist Supplies Inc.  
Midwest Arborist Supplies  

Microinfusion Supplies  
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Midwest Arborist Supplies  
Tree Line Supply Co.  

Miticides  
American Arborist Supplies Inc.  
Arborjet, Inc.  
Midwest Arborist Supplies  
Professional Tree Surgeon Supplies  

Mulch Coloring Equipment  
Alexander Equipment Co. Inc.  
American Arborist Supplies Inc.  
Forestry Suppliers, Inc.  
Southeastern Equipment Company  

Natural Homeopathic Remedies  
American Arborist Supplies Inc.  
SelfHEAL, Inc.  
Sherrill Arborist Supply  

Office Supplies  
Arbor Computer Systems  

Personal Protective Equipment  
American Arborist Supplies Inc.  
American Chainsaws & 2 Cycle, Inc.  
Arbor Direct, LLC  
Bailey’s  
Ben Meadows Company  
Bishop Company  
Cleaves Company, Inc.  
Climb Axe, Ltd.  
Commercial Cutters Direct  
Cutter’s Choice  
ESSCO Distributors Inc.  
Forestry Suppliers, Inc.  
Growtech, Inc.  
Karl Kuemmerling, Inc.  
Kramer Equipment Co., Inc.  
Midwest Arborist Supplies  
Petzl America  
Plastic Composites Corporation  
Professional Tree Surgeon Supplies  
Shelter Tree, Inc./Tree Care Products  
Sherrill Arborist Supply  
Tilton Equipment Co c/o Jonsered/EFCO  
Tree Line Supply Co.  
Tree Tools  
WesSpur, LLC  
Western Tree Equipment & Repair  

Pneumatic Tools  
American Arborist Supplies Inc.  
Karl Kuemmerling, Inc.  
Sherrill Arborist Supply  

Power Pruning Equipment  
ADI Pruning Tools by TOL Inc.  
American Arborist Supplies Inc.  
Bailey’s  
Ben Meadows Company  
Bishop Company  
Blue Ridge Arborist Supply  
Cleaves Company, Inc.  
ESSCO Distributors Inc.  
Growtech, Inc.  
Florian Ratchet-Cut  
Forestry Suppliers, Inc.  
Growtech, Inc.  
Karl Kuemmerling, Inc.  
Kramer Equipment Co., Inc.  
Midwest Arborist Supplies  
Professional Tree Surgeon Supplies  
SelfHEAL, Inc.  
Sherrill Arborist Supply  
Tree Tools  

Pruning Supplies  
ADI Pruning Tools by TOL Inc.  
American Arborist Supplies Inc.  
American Chainsaws & 2 Cycle, Inc.  
Arbor Direct, LLC  
Bailey’s  
Bishop Company  
Blue Ridge Arborist Supply  
Commercial Cutters Direct  
Cleaves Company, Inc.  
Climb Axe, Ltd.  
Commercial Cutters Direct  
Cutter’s Choice  
ESSCO Distributors Inc.  
Forestry Suppliers, Inc.  
Growtech, Inc.  
Karl Kuemmerling, Inc.  
Kramer Equipment Co., Inc.  
Midwest Arborist Supplies  
Northeastern Arborist Supply  
Professional Tree Surgeon Supplies  
Shelter Tree, Inc./Tree Care Products  
Sherrill Arborist Supply  
Tree Line Supply Co.  
Tree Tools  
WesSpur, LLC  
Western Tree Equipment & Repair  

Pumps  
American Arborist Supplies Inc.  
CUES, Inc.  
ESSCO Distributors Inc.  
Minnesota Wanner Company  
Northeastern Arborist Supply  

Recycling/Wood Processors  
American Arborist Supplies Inc.  
CUES, Inc.  
ESSCO Distributors Inc.  
Hollie Wood Enterprises  
Karl Kuemmerling, Inc.  
Northeastern Arborist Supply  
Southeastern Equipment Company  
V&H Inc.  
WesSpur, LLC  
Western Tree Equipment & Repair  

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Distributors (cont.) ...

**Repellents**
- American Arborist Supplies Inc.
- Ben Meadows Company
- ESSCO Distributors Inc.
- Forestry Suppliers, Inc.
- Midwest Arborist Supplies
- Sherrill Arborist Supply
- Tree Line Supply Co.

**Right-of-Way/Land Clearing Equipment**
- ADI Pruning Tools by TOL Inc.
- Cleaves Company, Inc.
- Payeur Distributions Inc.
- Rayco Manufacturing, Inc.
- Southeastern Equipment Company

**Root Barriers**
- American Arborist Supplies Inc.
- Ben Meadows Company
- Bishop Company
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Tools
- Western Tree Equipment & Repair

**Root Cutters**
- Tree Tools
- Western Tree Equipment & Repair

**Rope**
- Aerial Equipment, LLC
- Alexander Equipment Co. Inc.
- American Arborist Supplies Inc.
- American Chainsaws & 2 Cycle, Inc
- Arbor Direct, LLC
- Bailey's
- Ben Meadows Company
- Bishop Company
- Blue Ridge Arborist Supply
- Cleaves Company, Inc.
- Climb Axe, Ltd.
- Commercial Cutters Direct
- Cutter's Choice
- Droge Equipment Inc.
- ESSCO Distributors Inc.
- Forestry Suppliers, Inc.
- J. P. Fuller Inc.
- Growtech, Inc.
- Hollie Wood Enterprises
- Karl Kuemmerling, Inc.
- Kramer Equipment Co., Inc.
- Midwest Arborist Supplies
- Northeast Arborist Supply
- Petzl America
- Pigeon Mountain Industries
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Line Supply Co.
- Tree Tools

**Stump Cutters**
- Aerial Equipment, LLC
- Alexander Equipment Co. Inc.
- Blue Ridge Arborist Supply
- Cleaves Company, Inc.
- Crane & Shovel Sales Corp.
- Droge Equipment Inc.
- ESSCO Distributors Inc.
- Mickey's Truck & Equipment Sales
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Rayco Manufacturing, Inc.
- Sherrill Arborist Supply
- Southeastern Equipment Company
- WesSpur, LLC
- Western Tree Equipment & Repair

**Stump Cutters PTO**
- Blue Ridge Arborist Supply
- Droge Equipment Inc.
- Karl Kuemmerling, Inc.
- Professional Tree Surgeon Supplies

**Sprayers & Accessories**
- American Arborist Supplies Inc.
- Ben Meadows Company
- ESSCO Distributors Inc.
- Forestry Suppliers, Inc.
- J. P. Fuller Inc.
- Karl Kuemmerling, Inc.
- Minnesota Wanner Company
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Tools

**Stump Cutter Teeth**
- Aerial Equipment, LLC
- Alexander Equipment Co. Inc.
- American Arborist Supplies Inc.
- Blue Ridge Arborist Supply
- Cleaves Company, Inc.
- Crane & Shovel Sales Corp.
- Droge Equipment Inc.
- ESSCO Distributors Inc.
- Growtech, Inc.
- Midwest Arborist Supplies
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Rayco Manufacturing, Inc.
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Line Supply Co.
- Tree Tools

**Sweepers**
- Cleaves Company, Inc.
- J. P. Fuller Inc.

**Traffic Safety**
- American Arborist Supplies Inc.
- Ben Meadows Company
- Bishop Company
- Blue Ridge Arborist Supply
- Cleaves Company, Inc.
- ESSCO Distributors Inc.
- Forestry Suppliers, Inc.
- J. P. Fuller Inc.
- Karl Kuemmerling, Inc.
- Kramer Equipment Co., Inc.
- Midwest Arborist Supplies
- Northeast Arborist Supply
- Professional Tree Surgeon Supplies
- Shelter Tree, Inc./Tree Care Products
- Sherrill Arborist Supply
- Tree Line Supply Co.
- Tree Tools

**Trailers/Ramps**
- Aerial Equipment, LLC
- NESCO, Inc.
- Payeur Distributions Inc.
- WesSpur, LLC

**Tree Injection/Implant**
- American Arborist Supplies Inc.
- American Chainsaws & 2 Cycle, Inc.
- Arborjet, Inc.
- Ben Meadows Company
- Cleaves Company, Inc.
- Droge Equipment Inc.
- ESSCO Distributors Inc.
- Forestry Suppliers, Inc.
- Midwest Arborist Supplies
**Distributors (cont.) ...**

<table>
<thead>
<tr>
<th>Category</th>
<th>Company Name</th>
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<tbody>
<tr>
<td>Tree Injection/Implant (cont.)</td>
<td>Northeastern Arborist Supply</td>
</tr>
<tr>
<td></td>
<td>Professional Tree Surgeon Supplies</td>
</tr>
<tr>
<td></td>
<td>Shelter Tree, Inc./Tree Care Products</td>
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<tr>
<td></td>
<td>Sherrill Arborist Supply</td>
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<td></td>
<td>Tree Line Supply Co.</td>
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<tr>
<td></td>
<td>Tree Tech Microinjection Systems</td>
</tr>
<tr>
<td>Tree Protectors</td>
<td>American Chainsaws &amp; 2 Cycle, Inc.</td>
</tr>
<tr>
<td></td>
<td>Bailey's</td>
</tr>
<tr>
<td></td>
<td>Ben Meadows Company</td>
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<td>Cleaves Company, Inc.</td>
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<td>Forestry Suppliers, Inc.</td>
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<td>Growtech, Inc.</td>
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<td></td>
<td>Sherrill Arborist Supply</td>
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<tr>
<td></td>
<td>Tree Tools</td>
</tr>
<tr>
<td>Tree Spades</td>
<td>Ben Meadows Company</td>
</tr>
<tr>
<td>Trenchers</td>
<td>Ben Meadows Company</td>
</tr>
<tr>
<td></td>
<td>Concept Engineering Group, Inc.</td>
</tr>
<tr>
<td>Trucks &amp; Truck Accessories</td>
<td>Aerial Equipment, LLC</td>
</tr>
<tr>
<td></td>
<td>Aerial Lift, Inc.</td>
</tr>
<tr>
<td></td>
<td>American Arborist Supplies Inc.</td>
</tr>
<tr>
<td></td>
<td>CUES, Inc.</td>
</tr>
<tr>
<td></td>
<td>DICA Marketing Co.</td>
</tr>
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<td></td>
<td>G&amp;A Equipment, Inc.</td>
</tr>
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<td></td>
<td>Mickey's Truck &amp; Equipment Sales</td>
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<td>NESCO, Inc.</td>
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<td>Opdyke, Inc.</td>
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<td>Payeur Distributions Inc.</td>
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<td>Royal Truck &amp; Equipment, Inc.</td>
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<td>Southeastern Equipment Company</td>
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<td></td>
<td>Thayer Chevrolet Toyota - Great Lakes Ford Nissan</td>
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<td></td>
<td>V&amp;H Inc.</td>
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<tr>
<td>Utility Carts</td>
<td>The Cat Rental Store</td>
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<td></td>
<td>CUES, Inc.</td>
</tr>
<tr>
<td></td>
<td>Kramer Equipment Co., Inc.</td>
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<td>Rayco Manufacturing, Inc.</td>
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<td>Sherrill Arborist Supply</td>
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**Manufacturers (cont.) ...**

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<th>Category</th>
<th>Company Name</th>
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<td>Adjuvants/Miscellaneous Chemicals</td>
<td>Monterey Lawn &amp; Garden Products</td>
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<td></td>
<td>Nu-Arbor Tree &amp; Shrub Care Products</td>
</tr>
<tr>
<td></td>
<td>Plant Health Care, Inc.</td>
</tr>
<tr>
<td>Aerial Lifts</td>
<td>Aerial Lift, Inc.</td>
</tr>
<tr>
<td></td>
<td>Altec Industries, Inc.</td>
</tr>
<tr>
<td></td>
<td>American Truck &amp; Trailer Body Co.</td>
</tr>
<tr>
<td></td>
<td>Arbortech</td>
</tr>
<tr>
<td></td>
<td>Baker Equipment</td>
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<tr>
<td></td>
<td>MAT-3, Inc.</td>
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<tr>
<td></td>
<td>MTI Insulated Products Inc.</td>
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<tr>
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<td>Nifty Lift, Inc.</td>
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<td></td>
<td>Terex Telelect</td>
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<td></td>
<td>VERSALIFT, TIME Manufacturing</td>
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<tr>
<td>Aerial Lift Parts &amp; Equipment</td>
<td>Aerial Lift, Inc.</td>
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<tr>
<td></td>
<td>Alliance Equipment Company, Inc.</td>
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<td>Altec Industries, Inc.</td>
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<tr>
<td></td>
<td>Baker Equipment</td>
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<tr>
<td></td>
<td>Buckingham Manufacturing Co., Inc</td>
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<tr>
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<td>Jameson</td>
</tr>
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<td></td>
<td>MTI Insulated Products Inc.</td>
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<td>Nifty Lift, Inc.</td>
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<tr>
<td></td>
<td>Plastic Composites Corporation</td>
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<tr>
<td></td>
<td>U.S. Rigging Supply/Pelican Rope</td>
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<tr>
<td>Augers - Earth &amp; Bits</td>
<td>Border City Tool &amp; Manufacturing</td>
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<tr>
<td></td>
<td>Grow Gun Corporation</td>
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<tr>
<td></td>
<td>Karl Kuemmerling, Inc.</td>
</tr>
<tr>
<td></td>
<td>Power Planter, Inc.</td>
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<tr>
<td></td>
<td>Redmax-Komatsu Zenoah America</td>
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<tr>
<td></td>
<td>Tanaka Power Equipment</td>
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<tr>
<td>Bioinsecticides</td>
<td>Monterey Lawn &amp; Garden Products</td>
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<tr>
<td></td>
<td>Plant Health Care, Inc.</td>
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**Cabling & Bracing**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Berkshire Products, Inc.</td>
<td>Aerial Equipment Company</td>
</tr>
<tr>
<td>Preformed Line Products</td>
<td>Alaska Manufacturing Company</td>
</tr>
<tr>
<td>Vermeer Manufacturing Company</td>
<td>Aerial Equipment Company</td>
</tr>
<tr>
<td>Wall Industries</td>
<td>Injury Prevention Company</td>
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</table>

**Chain Saws & Accessories**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ADI Pruning Tools by TOL Inc.</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Alliance Equipment Company, Inc.</td>
<td>Alaska Manufacturing Company</td>
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<tr>
<td>Buckingham Manufacturing Co., Inc.</td>
<td>Aerial Equipment Company</td>
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<td>Husqvarna</td>
<td>Aerial Equipment Company</td>
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<td>Jameson</td>
<td>Aerial Equipment Company</td>
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<td>Oregon Cutting Systems</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Plastic Composites Corporation</td>
<td>Aerial Equipment Company</td>
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<td>Rapco Industries, Inc.</td>
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<td>Redmax-Komatsu Zenoah America</td>
<td>Aerial Equipment Company</td>
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<td>Stihl Inc.</td>
<td>Aerial Equipment Company</td>
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<td>Tanaka Power Equipment</td>
<td>Aerial Equipment Company</td>
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</table>

**Chippers**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Description</th>
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<tbody>
<tr>
<td>Bandit Industries, Inc.</td>
<td>Aerial Equipment Company</td>
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<td>Doskocil Industries, Inc.</td>
<td>Aerial Equipment Company</td>
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<td>Dynamic Manufacturing Corp.</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>J. P. Carlton Company, Div. DAF Inc.</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Karl Kuemmerling, Inc.</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>The Knifesource, LLC</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Morbark, Inc.</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Salsco, Inc.</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Trelan Manufacturing</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Vermeer Manufacturing Company</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Wood/Chuck Chipper Corporation</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Woodsman Chippers</td>
<td>Aerial Equipment Company</td>
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</tbody>
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**Chippers/Shredder/Vac**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Description</th>
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<tr>
<td>Dynamic Manufacturing Corp.</td>
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<td>The Knifesource, LLC</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Salsco, Inc.</td>
<td>Aerial Equipment Company</td>
</tr>
<tr>
<td>Wood/Chuck Chipper Corporation</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Woodsman Chippers</td>
<td>Aerial Equipment Company</td>
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</tbody>
</table>

**Climbing Gear**

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<th>Company Name</th>
<th>Description</th>
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<tr>
<td>Excalibur DMM</td>
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<tr>
<td>Karl Kuemmerling, Inc.</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>New England Ropes, Inc.</td>
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<td>Pigeon Mountain Industries</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>U.S. Rigging Supply/Pelican Rope</td>
<td>Aerial Equipment Company</td>
</tr>
<tr>
<td>Vermeer Manufacturing Company</td>
<td>Aerial Equipment Company</td>
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<tr>
<td>Wall Industries</td>
<td>Aerial Equipment Company</td>
</tr>
<tr>
<td>Weaver Leather, Inc.</td>
<td>Aerial Equipment Company</td>
</tr>
</tbody>
</table>
ICI
Buye
r~
Manufacturers (cont.) ...
Clothing
Agape Designs
Arborwear, LLC
Karl Kuemmerling, Inc.
Vermeer Manufacturing Company
Communication Systems
Arbor Computer Systems
Composting Equipment
Fecon, Inc.
Morbark, Inc.
Computer Hardware/Software
Arbor Computer Systems
Service Communication Software
Tree Management Systems, Inc.
Crane
Cargotec Inc.
Southco Industries, Inc.
Diagnostic Tools
Concept Engineering Group, Inc.
Engines & Engine Parts
DEUTZ Corporation
Enginaire
Woodsman Chippers
Excavators
Concept Engineering Group, Inc.
Rayco Manufacturing, Inc.
Fertilization Supplies
Creative Sales, Inc.
Doggett Corporation
GreenPro Services
Grow Gun Corporation
Horticultural Alliance, Inc.
J. J. Mauget Company
Monterey Lawn & Garden Products
Nu-Arbor Tree & Shrub Care Products
Plant Health Care, Inc.
Tree Tech Microinjection Systems
Fertilization/Aeration Equipment
Concept Engineering Group, Inc.
Doggett Corporation
Grow Gun Corporation
Minnesota Wanner Company
Nu-Arbor Tree & Shrub Care Products
Rear's Mfg. Co.
Footwear
Karl Kuemmerling, Inc.
West Coast Shoe Co.
Fungicides
ArborSystems, LLC
Bayer Corp. - Bayer Professional Care
J. J. Mauget Company
Monterey Lawn & Garden Products
Tree Tech Microinjection Systems
General Arborist Supplies
Arborwear, LLC
Bahco Tools Inc.
Bartlett Manufacturing Company
Bashlin Industries, Inc.
Berkshire Products, Inc.
Buckingham Manufacturing Co., Inc
Corona Clipper
Fanno Saw Works
Jameson
Karl Kuemmerling, Inc.
The Knifesource, LLC
Oregon Cutting Systems
Peavey Mfg. Co.
U.S. Rigging Supply/Pelican Rope
Vermeer Manufacturing Company
Village Blacksmith/Olympia Industrial Wall Industries
Weaver Leather, Inc.
Grapples/Loaders
Implenex Equipment Co., Inc.
Vermeer Manufacturing Company
Grinders, Horizontal
Bandit Industries, Inc.
Fecon, Inc.
Morbark, Inc.
Ground Cover Equipment - Mats
Attunamats, Inc.
DICA Marketing Co.
Growth Retardants/Regulators
Monterey Lawn & Garden Products
Tree Tech Microinjection Systems
Herbicides
BBA Nonwovens/Reemay Inc./Biobarrier
Bayer Corp. - Bayer Professional Care
Monterey Lawn & Garden Products
Tree Tech Microinjection Systems
Hydraulic Tools & Equipment
ADI Pruning Tools by TOL Inc.
FCI-Racine Hydraulic Tools
Insecticides
ArborSystems, LLC
Aventis Environmental Science
Bayer Corp. - Bayer Professional Care
Creative Sales, Inc.
FMC Corporation-APG Specialty Prod.
J.J. Mauget Company
Monterey Lawn & Garden Products
Tree Tech Microinjection Systems
Integrated Pest Management
Plant Health Care, Inc.
Irrigation/Aeration Products
Concept Engineering Group, Inc.
Knives, Chippers
Karl Kuemmerling, Inc.
The Knifesource, LLC
Simonds Industries, Inc.
Vermeer Manufacturing Company
Wood/Chuck Chipper Corporation
Woodsman Chippers
Zenith Cutter Co.
Knives, Chippers - Repair
The Knifesource, LLC
Simonds Industries, Inc.
Vermeer Manufacturing Company
Woodsman Chippers
Lawn Maintenance Equipment
Attunamats, Inc.
Concept Engineering Group, Inc.
Corona Clipper
Dynamic Manufacturing Corp.
Minnesota Wanner Company
Rear's Mfg. Co.
Stihl Incorporated
Lightning Protection Systems
Independent Protection Company
Microinjections
J.J. Mauget Company
Tree Tech Microinjection Systems
Miticides
ArborSystems, LLC
FMC Corporation-APG Specialty Prod.
Tree Tech Microinjection Systems
Mulch Coloring Equipment
Fecon, Inc.
Morbark, Inc.
Natural Homeopathic Remedies
Doggett Corporation
Personal Protective Equipment
Arborwear, LLC
Bartlett Manufacturing Company
Bashlin Industries, Inc.
Buckingham Manufacturing Co., Inc
Excalibur DMM
Stihl Incorporated
Tilton Equipment Co c/o Jonsered/EFCO
U.S. Rigging Supply/Pelican Rope
Vermeer Manufacturing Company
Wall Industries

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Manufacturers (cont.) ...

**Pneumatic Tools**
- Concept Engineering Group, Inc.

**Power Pruning Equipment**
- Florian Ratchet-Cut
- Husqvarna
- Jameson
- Redmax-Komatsu Zenoah America
- Stihl Incorporated
- Tanaka Power Equipment
- Village Blacksmith/Olympia Industrial

**Root Barriers**
- Deep Root Partners L.P.

**Root Cutters**
- Corona Clipper
- Vermeer Manufacturing Company

**Rope**
- Bartlett Manufacturing Company
- Bashlin Industries, Inc.
- Buccaneer Rope Co.
- Karl Kuemmerling, Inc.
- New England Ropes, Inc.
- Plymkaft, Inc.
- Samson Rope Technologies
- U.S. Rigging Supply/Pelican Rope
- Vermeer Manufacturing Company
- Wall Industries

**Skidsteer Loaders & Implements**
- Brush Technology
- Implemax Equipment Co., Inc.
- Rayco Manufacturing, Inc.
- Woodsman Chippers

**Snow Removal Equipment**
- Dynamic Manufacturing Corp.

**Soil Amendments**
- Doggett Corporation
- GreenPro Services
- Plant Health Care, Inc.

**Sprayers & Accessories**
- Bartlett Manufacturing Company
- ESSCO Distributors Inc.
- GreenPro Services
- John Bean Sprayers
- Minnesota Wanner Company
- Northeastern Arborist Supply
- Rear's Mfg. Co.
- Southern Farm Equipment Inc.
- Stihl Incorporated

**Stump Cutters**
- Doskocil Industries, Inc.
- Dynamic Manufacturing Corp.
- Husqvarna
- J. P. Carlton Company, Div. DAF Inc.
- Miller Machine Works
- Rayco Manufacturing, Inc.
- Stump Removal Inc./KAN-DU
- Vermeer Manufacturing Company

**Stump Cutters PTO**
- Fecon, Inc.
- Miller Machine Works

**Stump Cutters Teeth**
- Border City Tool & Manufacturing
- CEI

**Sweepers**
- Redmax-Komatsu Zenoah America
- Stihl Inc.

**Traffic Safety**
- Bartlett Manufacturing Company
- Karl Kuemmerling, Inc.

**Tree Injection/Implants**
- ArborSystems, LLC
- Creative Sales, Inc.
- Doggett Corporation
- GreenPro Services
- Grow Gun Corporation
- J. J. Maugel Company
- Tree Tech Microinjection Systems

**Tree Protectors**
- Deep Root Partners L.P.

**Tree Spades**
- Vermeer Manufacturing Company

**Tree Transplanting Equipment**
- Vermeer Manufacturing Company

**Trenchers**
- Concept Engineering Group, Inc.
- Doskocil Industries, Inc.
- Vermeer Manufacturing Company

**Trucks & Truck Accessories**
- Aerial Lift, Inc.
- Altunamats, Inc.
- American Truck & Trailer Body Co.
- Arbortech
- DICA Marketing Co.
- Plastic Composites Corporation
- Royal Truck & Equipment, Inc.
- Schodorf Truck Body & Equip Co.
- Southco Industries, Inc.
- Specialized Hydraulics, Inc.

**Tub Grinders**
- Fecon, Inc.
- The Knifesoce, LLC
- Morbark, Inc.
- Vermeer Manufacturing Company

**Used Equipment**
- Karl Kuemmerling, Inc.
- Morbark, Inc.
- Rayco Manufacturing, Inc.
- Schodorf Truck Body & Equip Co.
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## Used Equipment (cont.)
- Specialized Hydraulics, Inc.
- Trelan Manufacturing
- Vermeer Manufacturing Company
- Wood/Chuck Chipper Corporation

## Wood Furnaces, Outdoor
- Central Boiler

### Industry Support & Services Providers

#### Aerial Lifts Parts & Equipment
- Aerial Equipment, LLC
- Plastic Composites Corporation

#### Aerial Lift Parts & Equipment - Repair
- Aerial Equipment, LLC
- Aerial Lift, Inc.
- Alliance Equipment Company, Inc.
- CUES, Inc.
- Mickey’s Truck & Equipment Sales
- MIRK, Inc./Toombs Truck & Equip.
- Sunbelt Rentals

#### Business Opportunity
- Arbor Computer Systems
- Christmas Decor & Nite Time Decor

#### Computer Software/Hardware
- ACRT, Inc.
- Arbor Computer Systems
- Creative Automation Solutions/
  ArborSoftWorx
- Practical Solutions, Inc.
- Tree Management Systems, Inc.

#### Consulting - Business
- Arbor Computer Systems
- Arborist Skills, Inc.
- Creative Automation Solutions/
  ArborSoftWorx
- Environmental Consultants, Inc.
- Howard L. Eckel & Associates

#### Consulting - Urban Forestry
- ACRT, Inc.
- Safetrees

#### Diagnose Disease
- Concept Engineering Group, Inc.

#### E-Commerce for Businesses
- GreenIndustryYellowPages.com

#### Education/Workshops/Training/Reference
- ACRT, Inc.
- Arborist Skills, Inc.
- ArborMaster Training, Inc.
- Forest Applications Training, Inc.
- Integrity Tree Care/Training with Integrity
- J. J. Maugut Company
- Safetrees
- Tree Safety International
- Tree Tools

#### Fertilization Supplies Application
- ESSCO Distributors Inc.

#### Financing
- American Express Business Financial
- C.A.G. Corporation
- Greystone Financial Group, Inc.
- Liberty Financial Group, Inc.
- OBL Financial Services, Inc.
- Southeastern Equipment Company
- Tree Tools
- V&H Inc.

#### GPS Mapping
- ACRT, Inc.
- Vermeer Manufacturing Company

#### Insurance
- CNA Commercial Insurance
- Hal Rose Agency Inc.
- National Insurance Programs
- NRC Insurance Agency
- Ogilvy Hill Insurance
- Sol J. Oberman Insurance
- T.I.S. Insurance Services Inc.
- The Hartford
- TreePro Direct™

#### Lease/Rental
- Aerial Equipment, LLC
- Baker Equipment
- CUES, Inc.
- Greystone Financial Group, Inc.
- Karl Kuehmerling, Inc.
- Liberty Financial Group, Inc.
- Lowe’s Company, Inc.
- MAT-3, Inc.
- MIRK, Inc./Toombs Truck & Equip.
- Southeastern Equipment Company
- V&H Inc.
- Vermeer Manufacturing Company
- WesSpur, LLC

#### Pneumatic Tools - Repair
- Aerial Lift, Inc.
- CUES, Inc.

#### Recycled Wood Processors - Repair
- MAT-3, Inc.
- Southeastern Equipment Company

#### Regulatory Affairs
- ACRT, Inc.

#### Repair/Rebuilding
- Cleaves Company, Inc.
- Engine Center
- MAT-3, Inc.
- Shelter Tree, Inc./Tree Care Products
- Southeastern Equipment Company
- Specialized Hydraulics, Inc.
- Tree Tools
- V&H Inc.
- Vermeer Manufacturing Company
- WesSpur, LLC

#### Soil Amendment
- Concept Engineering Group, Inc.

#### Transportation Services
- Mayo Global Transportation Inc.
Alphabetical Listing

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