Here's why Disc Chipper users are going back to Drum Chippers.

More Dumping Fees.
More Repair Costs.
More Downtime.
More Fuel Consumption.
More Overheating.

Do you need to chip everything?

If you're like most disc owners, you've been chipping more of what was once sold as firewood (or left for people to take), and have watched your dumping fees go up and your productivity go down. Your crews spend more time running to the dump, clearing jammed chutes, washing down radiator screens and waiting for overheated engines to cool.

The Asplundh Whisper Chipper not only offers lower operating costs, but extremely low cycle costs. And, how many used disc chippers have you seen for sale after ten years of service?

Are you spending more on fuel?

At 70- to 120-feet per minute, it takes a disc chipper almost three times longer than a Whisper Chipper to chip six-inch material. How much more fuel do you think it uses? And, with the engine running longer, you’re looking at shorter engine life and, again, higher operating costs.

The Asplundh Whisper Chipper saves time, fuel, and, most important, money.

Are you paying hydraulic mechanics more?

The chart below compares replacement parts for a Whisper Chipper with those of a popular disc chipper.

<table>
<thead>
<tr>
<th>Hydraulic System</th>
<th>Whisper Chipper</th>
<th>Disc Chipper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blades Belts Cutter Bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic tubes, fittings, hoses, motors, filters, tanks, flow dividers, O-rings, seals (over 30 hydraulic components alone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed System</td>
<td>Feed wheels, feed teeth, bearings, bushings, feed wheel springs, feed wheel yokes, etc., etc.</td>
<td></td>
</tr>
</tbody>
</table>

Whisper Chippers have far less downtime. That translates into more time making money and less spending it.

Are you ready to think about a drum chipper?

The Whisper – designed, built, used and backed by Asplundh – carries a one-year warranty honored by the most extensive service in the industry. Plus, with full-sized Whispers starting at $8950, you’ll keep your investment at its lowest and your yield at its highest.

Come back to the Asplundh Whisper Chipper... the chipper that keeps paying dividends for up to 20 years.

Asplundh Ability. See it in action.

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COVER PHOTO:
Systemic tree treatment is not new, but it’s still controversial. Photo courtesy of Bartlett Tree Expert Co. Story on Page 4.
Last year the word was, “Cash is king for the ’90s.” No doubt that is true today, but it’s a little more difficult right now to keep the king on the throne.

Reports I get from tree service firms all over the country indicate that sales are still tough to come by. Most people are working twice as hard to sell half as much, but they are doing it. Many tell me that profits are down, but they are still making a profit. Cash flow had been slow, but it has been flowing. It certainly isn’t business as usual, but nobody ever said that business was easy.

This economy hasn’t dampened anyone’s enthusiasm. There have been a few failures in the tree care industry and some are really struggling, but almost everyone I talk to says the same thing: “Hey, we are going to make it!” With that kind of an attitude you most certainly will.

When everything is good, when sales and profits are easy to come by, we tend to get careless and complacent. We don’t watch the little things. When times are tight we watch everything. Times like this test your skills as business people. You will all be better for this experience.

There is another very encouraging dimension that could help to make things easier for all concerned. Everything I read and everything I hear mentions “environmentally sound,” “ecologically smart” and “environmental improvement.” Granted, these are all buzz words but these seem to be the hot buttons. Let’s use them. They certainly describe everything that you do.

You are a true environmentalist. You spend every day preserving trees, improving the environment using sound, smart practices. Why not tell your marketplace?

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You are a true environmentalist. You spend every day preserving trees, improving the environment using sound, smart practices. Why not tell your marketplace? Why not get on the bandwagon? Capitalize on the opportunity.

You have heard a great deal about the president’s “America the Beautiful” initiative. That program will continue through 1992. People will be reading and hearing about planting trees and, hopefully, about caring for existing trees. Take advantage of the opportunity to be part of the program. It doesn’t cost a cent. All you have to do is refer to the America the Beautiful program in your sales and marketing. Talk about the contribution that trees make to the environment and the environmentally sound, ecologically smart services that you can provide.

For years we have been perceived as part of the problem. Now there is an opportunity to be part of the solution and it’s just sitting there waiting for you to latch on to it.

Invite your customers to be part of this environmental movement by investing in their own piece of the environment. It’s a win-win situation. The customers win, the trees win and you win.
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WOOD/CHUCK® Makes 'Em Both!

The Wood/Chuck Chipper Corporation has built chippers for over 20 years and knows that different styles of chippers are needed. If you need landscape quality chips, a controlled feed rate and chip up to 12 inch material, the Disc is for you. However, if you require a fast feed rate with material up to 6 inches, economic design and low life cycle cost, then the Drum is your buy.

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Dennis A. Beam III
Vice President

Wood/Chuck Chipper Corporation is a subsidiary of D.A. Beam Enterprises, Ltd., and is affiliated with Aerial Devices, Inc., manufacturer of the "SkyRider" and Safety Test and Equipment Co., Inc.

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Systemic Tree Treatment

Two researchers from Bartlett Tree Expert Company experiment with systemic injection 40 years ago.
By Michael Simmons and Peter Gerstenberger

Perhaps no subject in tree care is surrounded by so much controversy as systemic tree treatment. While some view systemic tree treatments as state-of-the-art, others claim they are fraud, or do more harm than good. There is evidence to support any of these positions.

Systemic treatment is perhaps best described as an imperfect science. Few modern textbooks about arboriculture discuss systemic tree treatments at length, and there is no definitive current text on the subject.

It is impossible to make generalizations about injection except to say that in the hands of a knowledgeable and conscientious arborist, it can be a beneficial tree care practice. Here is a look at injection from the standpoint of tree health and the strengths and limitations of the most widely accepted treatments.

The idea of systemic tree treatment borrows heavily from concepts developed in medicine. Many of the early systemic tree treatments were not developed by professionals in the field of plant science but rather by creative thinkers who possessed a broad range of talents. In fact, Leonardo DaVinci, an engineer, painter and scientist who lived in the 15th century, is considered the first individual to inject liquid into trees. In his writings, he gave a detailed account of how he injected dissolved arsenic compounds into apple trees to poison the fruit so to dissuade potential apple thieves.

Evidence indicates trees and shrubs were injected with solid materials as early as the 1100s. At best, these early attempts at tree injection were inspired guesses because little was known about how trees functioned. Nonetheless, their goal was to improve the health of trees or produce certain special qualities.

Continued on Page 7

MAUGET MICRO-INJECTION
TREE INJECTION PRODUCTS COMPANY

Jim Cortese, president of Tree Injection Products and Cortese Tree Specialists in Tennessee, is a distributor for Mauget micro-injection products. The Mauget system delivers pre-measured amounts of concentrated pesticide, antibiotic or fertilizer from small, pressurized capsules. The term micro-injection is derived from the fact that the Mauget process uses what is claimed to be the smallest, shallowest wound on the market today. A 7/64-inch or 11/64-inch drill is used to make a 3/8-inch deep hole in the xylem.

Cortese likens the Mauget system to "...a drug store for trees." A wide array of products makes it possible for him to treat a broad range of tree problems. Cortese does not view micro-injection as a panacea for tree problems but as an alternative form of treatment to be used for specific problems in combination with other beneficial tree care practices. His Mauget distributorship exemplifies the company's active role in arborist education. Each distributor accepts the responsibility for educating applicators and keeping them abreast of the latest technology.

Mauget distributors have held over 900 injection seminars since 1977. As they have refined the injection technology, they have passed the information along to the applicator via the seminars, newsletters and personal communication.

In Cortese's area, the liability of spraying is prohibitive. Most of the larger tree companies have abandoned conventional operations. Cortese Tree uses only backpack sprayers and Mauget treatments in its pesticide application.

Unfortunately, the state agencies responsible for applicator training are locked into conventional pesticide applicator training, which is one reason that Mauget has had to be aggressive with training.

Distributors are given a great deal of latitude in how they carry out training. Some like Cortese are using a combination of correspondence courses, video, field demonstration and hands-on training to teach fundamental tree biology, tree anatomy and injection technology.

Cortese also teaches alternatives to injection and keeps applicators informed with a semi-annual newsletter. He shows students "negative" trees as examples, and relates the experiences, good and bad, from his tree company's use of injections. His distributorship targets prospective clients with the technological ability to use injection beneficially, and serves as a technical resource for those clients.

Mauget micro-injection, like other forms of systemic tree treatment, has endured criticism from the scientific community and the tree industry. Cortese points to two reasons for this criticism. First, Mauget had some unscrupulous sales representatives early in its history, and the reputation they left has been hard to shake. Second is what Cortese calls "...one of the truths of injection." He maintains that many people in the scientific community, especially extension agents, are not convinced of the merits of injection because they are generally consulted only when a problem arises with an application. They aren't necessarily on hand to witness the many successes with injection.
Tom Prosser, of Rainbow Tree Company in Minnesota, started injecting American elms in Minneapolis while he was still in high school. At first he used lignosan, but an unacceptable number of treated trees died. Later he switched to Arbotect using one to four ounces of active ingredient for five inches of tree diameter. He continued this for two years with only modest success until studies conducted at the University of Minnesota showed that higher concentrations (12 oz./five inches d.b.h.) worked much better. Moving the injection site from the trunk to the root flare increased uptake rates and lateral movement of the chemical while minimizing tree damage.

Rainbow uses a FlowJet pump drawing from a 33-gallon container to inject 30 to 40 gallons of solution in the average elm. Injectors are spaced three to six inches apart, with one and a half to two injection sites per inch of trunk diameter. A mature tree takes 45 minutes to two hours to inject, and a three-person crew injects between eight and 15 trees a day.

Rainbow guarantees its treatment for three years and offers refunds for treatments that fail. Elm injection crews are trained to detect early symptoms of disease and low vigor, and the company generally recommends delaying treatment for trees in poor health. In the meantime, they will prescribe a regimen which may consist of pruning, low nitrogen fertilization, soil aeration, pesticide application and adjustments to watering in order to get the elm healthy. In suburbs where surrounding elms often are not being treated, Rainbow will either trench or install a Vapam barrier to prevent root graft transmission of the causal fungus. Arbotect is ineffective against root graft infections.

The Arbotect system used by Rainbow Tree Care.

which were infected through root grafts. Minneapolis, because of its aggressive efforts to save its elms through injection and sanitation, has over 50% of its trees remaining. Neighboring St. Paul, by contrast, has less than 10% of its elms.

ACECAPS TO SUPPRESS GYPSY MOTHS
COLLINS TREE SERVICE

Those who have never witnessed a serious gypsy moth infestation first-hand might try to imagine a December landscape in June. The oaks in the pockets of heaviest infestation are completely stripped of their leaves; other species also are affected. Some trees never recover.

Larry Collins, owner of Collins Tree Service in New Hampshire, has seen several gypsy moth outbreaks in his 30 years in business. During the current outbreak and the one 10 years ago, he has been systematically treating select trees with Acecaps from Creative Sales, Inc. with favorable results.

Collins knows the importance of keeping injection holes small and the many other precautions for using systemic treatments. "We only use implants on trees we can't spray and on trees that I am convinced would be dead if it weren't for this treatment," he says. While he has used various injection techniques for many years, he prefers the Acecap/Medicap implants because "you can put them in and walk away. With other systems, I didn't always have time to wait around for complete uptake of the material."

Acecap systemic implant.

He says an advantage of using Acecaps for gypsy moth is "that when you know there is going to be an outbreak, you can treat the tree slightly in advance to really minimize damage." Like many other successful companies that use injection, Collins Tree Service does not practice the technique extensively but uses it only as part of a comprehensive tree health maintenance program that may include fertilization, pruning and other treatment.
Systemic tree treatment was first used commercially around 1914 when a commercial firm of “tree doctors” in Pennsylvania was doing extensive business “vaccinating” trees. The procedure involved inserting capsules containing various compounds such as potassium cyanide, potassium chlorate and iron sulphate in bark incisions. Those who practiced it claimed these treatments would increase the vigor of the tree and provide immunity from all insects and diseases. Their fees ranged from 13 cents to 50 cents per tree, and thousands of trees were treated. Scientific scrutiny of the injected trees revealed no evidence of any beneficial effects from these treatments, however, and, in fact, many of the treated trees died.

The introduction of better systemic chemicals broadened the scope of treatment. Today, there are many different delivery systems. Infusion involves procedures that rely solely on the tree’s transpiration stream as the force for moving introduced materials. Injection applies to treatments that use pressure to introduce and help distribute material. Implantation of dry materials is really a form of infusion since no outside force is used to disperse the material.

Prior to 1960, gravity flow methods were the predominant injection techniques used. Limited amounts of chemical solution were injected since uptake was slow, but the solution had to be quite concentrated to be effective. Unfortunately, concentrated chemicals were often phytotoxic to the leaves, twigs and cambium. Several gravitational systems are still being used today, such as the low-volume types that use bottles or bags attached to the tree.

**COMPARISON OF TREE INJECTION PRODUCTS**

<table>
<thead>
<tr>
<th>Manufacturer (Trade Name)</th>
<th>Injection Hole Dia. &amp; Depth (inches)</th>
<th>Type of Product</th>
<th>Delivery Method</th>
<th>No. of Units /20&quot; d.b.h.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative Sales, Inc. (Acecaps)</td>
<td>24/64 7/8</td>
<td>Insecticide</td>
<td>Implant near the ground</td>
<td>15</td>
</tr>
<tr>
<td>P.O. Box 501</td>
<td>Fremont, NE 68025</td>
<td>1-800-759-7739</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative Sales, Inc. (Medicaps)</td>
<td>16/64 &amp; 24/64 7/8-1 1/4</td>
<td>Nutrients</td>
<td>Implant</td>
<td>15</td>
</tr>
<tr>
<td>MSD AGVET (Arbotect)</td>
<td>16/64 1</td>
<td>Fungicide</td>
<td>Large volume pressure injection in root flare</td>
<td>30-40</td>
</tr>
<tr>
<td>Div. Merck &amp; Co., Inc.</td>
<td>Rahway, NJ 07065-0912</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maugan Tree Injection Products</td>
<td>7/64 &amp; 11/64 3/8-1/2</td>
<td>Nutrients, Insecticides, Fungicides, Antibiotics</td>
<td>Small volume “micro-injection” near the ground</td>
<td>10</td>
</tr>
<tr>
<td>2810 No. Figueroa St</td>
<td>Los Angeles, CA 90065</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-800-TREES-RX</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Medi-ject Tree Inject Systems</td>
<td>24/64 &amp; 28/64 1-1 1/2</td>
<td>Iron, Nutrients</td>
<td>Large volume, gravity flow or pressure injection in root flare</td>
<td>8</td>
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<tr>
<td>520 Eldora Lane</td>
<td>Lincoln, NE 68505</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-800-728-2749</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pin Oak Tree Specialists</td>
<td>24/64 2-3</td>
<td>Iron</td>
<td>Small volume, squeeze bottle</td>
<td>14-18</td>
</tr>
<tr>
<td>7310 N. 39 Terrace</td>
<td>Omaha, NE 68112</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(402) 455-9384</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source Technology</td>
<td>20/64 1</td>
<td>Fungicide</td>
<td>Large volume, pressurized tank &amp; T-fittings 2&quot; above soil line</td>
<td>10-15</td>
</tr>
<tr>
<td>Biologicals, Inc. (Phyton-27)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3355 Hiawatha Ave. South</td>
<td>Minneapolis, MN 55406</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-800-ELM-TREE</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* - This listing is for reader information purposes only and does not constitute an endorsement of any of the above-mentioned products.
and somewhat larger-volume methods that use suspended gallon containers.

After 1960, pressurized injection systems were developed, offering several advantages. Large volumes of less concentrated solutions could be administered to the tree, reducing the possibility of phytotoxicity and eliminating the problem of precipitation of some chemical solutions. Early systems used pressures in the range of 100-400 p.s.i., depending upon the chemical selected and the rate of uptake desired. However, these high-pressure systems often resulted in leakage at the injection site as well as damage to the tree's vascular system. In a series of investigations, Dr. Alex Shigo and Dr. Richard Campana reported finding decay associated with injection wounds in American elms. They also reported seeing large columns of discolored wood at the wound area and fluxing from wounds made in previous years. Their investigations led to a better understanding of the effects of pressure, the importance of keeping wounds small and shallow and where on the tree to make the injections.

**Injection should be used as an alternative when other methods are not practical.**

Today injection techniques use pressures of 10-20 p.s.i., although some systems still use pressures of over 100 p.s.i.

Current injection/implantation systems differ significantly in technology and purpose. There are many variations for controlling Dutch elm disease, while others aim to alleviate nutritional deficiencies or apply plant growth regulator compounds. Several of these systems are described in Table 1.

A few systems feature an older technology. Liquids are placed in bark frills or drill holes made in the tree from squeeze bottles or eyedroppers. The squeeze bottle method is popular in China for controlling scale insects on pine trees.

A few systemic treatments currently used do not rely upon gravity or pressure, but rather the insertion of dry materials into the tree. In the most notable method of implantation, dry, soluble chemicals in a membranous capsule are placed in a small plastic cartridge and permanently inserted in the tree. Special cartridges are available for correcting nutritional deficiencies and for controlling specific insects.

Another form of implantation is employed primarily in Europe. Pellets containing the parasitic fungus Trichoderma are inserted into drill holes in the tree. As the propagules of the fungus develop inside the tree, they feed upon Ceratocystis, the organism that causes Dutch elm disease.

**Injection and your firm**

Many companies today are trying to decide if they should include tree injection or...
Time is money in the tree care business, and the time you save with Versalift puts money in the bank.

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Each system has special requirements that must be met. Shortcuts can lead to an ineffective or inefficient program.

1. Have basic knowledge of tree anatomy and tree physiology. This is necessary to maintain the health of the tree. Similar words were written by P.P. Pirone in his book, Tree Maintenance. A thorough understanding of how a tree works is key to successfully running a tree care business. This is especially true for treating insect and disease problems. A lack of basic knowledge may go unnoticed in certain aspects of an operation, but would be obvious with tree injection or infusion. Successful treatment relies on a thorough understanding of the tree's anatomy, the physiological processes affected by a particular treatment and the environmental conditions affecting the effectiveness of the product(s) used.

2. Establish a valid need for systemic tree treatment. Examples of valid needs might be treatment of cholorotic trees for micronutrient deficiencies, fertilization of trees affected by environmental restrictions and treatment of American elms as part of a complete Dutch elm disease control program. Because systemic treatment uses minimum amounts of pesticide to control specific damaging insects, it can fit well into a program of Integrated Pest Management (IPM). Some companies started treating trees systemically for economic reasons. While this may initially appear to be a healthy approach to business, it can create serious problems later. The technology has limitations, and not knowing those limitations can lead to misuse. Injection should be used as an alternative when other methods are not practical.

3. Make a decision. Tree injection is a controversial issue with its share of pro and con opinions; the decision on whether to use it should be based on an assessment of the tree’s needs and the company’s abilities. Arborists should not go to conferences or seminars expecting someone else to make the decision for them. The responsibility is theirs and theirs alone.

4. Use treatments conservatively. A company should begin trying on a limited scale a particular system that seems to best fit its demands. This approach will provide “hands-on” experience with its technique, evidence of its effectiveness and proof of benefits supplementing the com-

Continued on Page 12
## BUY IT/ LEASE IT

<table>
<thead>
<tr>
<th><strong>Morbark Disc Chippers</strong></th>
<th><strong>Lease</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 cyl. Ford gas</td>
<td>$11,500 $352</td>
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<tr>
<td>4 cyl. White gas</td>
<td>$11,500 $352</td>
</tr>
<tr>
<td>4 cyl. Cummins</td>
<td>$14,995 $460</td>
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4 -knife option add $500

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<tr>
<td>20/10</td>
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<th><strong>Rayco Stump Grinders</strong></th>
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<td>Model RG1620: 20 H.P.</td>
<td>$6,850 $218</td>
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<tr>
<td>Model RG1635-A/SP: 35 H.P.</td>
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<tr>
<td>Model RG1655-AC: 65 H.P.</td>
<td>$14,995 $460</td>
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<tr>
<td>Model 1670DC: 80 H.P.</td>
<td>$21,500 $654</td>
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<tr>
<td>Rayco Hydro Stumper: 240 H.P.</td>
<td>$85,000 $2,344</td>
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<th><strong>Asplundh Drum Chippers</strong></th>
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</thead>
<tbody>
<tr>
<td>4 cyl. Ford or Hercules gas with 12&quot; cutter head</td>
<td>$10,900 $335</td>
</tr>
<tr>
<td>Asplundh Chipmunk</td>
<td>$9,500 $303</td>
</tr>
</tbody>
</table>

* All lease purchases require 2 payments down. $1.00 buy-out with approved credit. Other lease plans available. Used Asplundh & Morbark chippers and Rayco stump grinders available.
When the wrong tree species grows around utility wires, the situation is less than ideal for the tree and the utility company. Replacing trees with more suitable species provides the long-term solution to the problem of pruning, removing or injecting trees under distribution wires. However, it is not a solution that can be implemented immediately. Therefore, utility arborists must rely upon short-term solutions, and injection of tree-growth-regulating substances, while admittedly based on economics, has been successful.

Potomac Edison has been active in tree injection using Cutless*. Mike Watson of P.E. reports an average 40% reduction in regrowth the year after treatment. Treated trees are pruned half as often as untreated trees, which represents an annual cost savings of 48%.

The benefits of using TGRs will be highest where trees respond quickly to treatment, where trimming cycles are usually short, and where use of TGRs will significantly extend the pruning cycle.

Here are P.E.'s criteria for determining that a tree should not be injected:
- When there is a cavity or decay column half the diameter of the tree or larger.
- When there is heavy decay in the crown.
- When the tree is missing bark from half or more of its circumference.
- When the tree is less than six inches in diameter.
- When the tree has a severe insect infestation or is under some other form of extreme stress.
- If the tree is a conifer; the treatment isn't effective in conifers.
- If the tree is a birch or yellow poplar because of known problems.
- If the tree is being side-trimmed there is no economic advantage to using injection.

Though other methods of TGR application are effective, injection is thus far the only viable one. Watson knows that trunk injection, using relatively large injection holes, high pressure and an alcohol carrier, will cause injury to the xylem and even the cambium. He views the tradeoff this way. Pruning live wood effectively wounds the tree. Most trees, especially fast-growing species, aren't effective at compartmentalizing the heading back cuts typically used for line clearance. In the case of Potomac Edison, injection drastically reduces the impact of severe pruning.

TGR injection at Potomac Edison.

- When the tree has a severe insect infestation or is under some other form of extreme stress.
- If the tree is a conifer; the treatment isn't effective in conifers.
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- If the tree is being side-trimmed there is no economic advantage to using injection.

Though other methods of TGR application are effective, injection is thus far the

* Cutless is a registered trademark of Elanco Products Company

pany's services. The ideal situation is for the program to grow as the company's experience with the technology grows.

5. Make a commitment to learning how systemic treatments work. The arborist should fully understand treatment technology. Initially, this may involve considerable time, but by learning the basics he will find it easier to adjust to continuing technological changes and will gain confidence in the system.

6. Play by the rules. Each system has special requirements. In order to achieve the best results, minimize injury to the tree and satisfy the customer's expectations, these requirements must be met. Shortcuts can lead to an ineffective or inefficient program. Pay attention to proper technique, label information and manufacturer's recommendations.

Proper systemic tree treatment takes skill and dedication. It can be a valuable addition to tree care operations if interested individuals are aware of the various systems that are available and feel they can comply with the advice in the six steps.

Michael Simmons is vice president of Tree Inject Systems, Ltd., in Jersey Shore, Pennsylvania.
Drilling and hooking up an injector for Phyton-27. This large tree required two injection systems. The holes have been drilled higher than normal because of a previous injection.

Little has treated a handful of valuable trees with Phyton for several years, with favorable results. The only treated trees that were lost were those that showed infection in over 5% of the canopy at the time of treatment. She reports that one adverse side-effect of treatment is the partial to almost complete defoliation of trees soon after treatment. This is disturbing to the tree owners, but Little reassures them that trees re-foliate later in the growing season.

The cause of the defoliation remains a mystery. Apparently this is a regional oddity—it has even been called “the upper Midwest phenomenon.” Elms injected with pure water will drop leaves, so it is not a toxic reaction. The premature leaf drop seems to have some correlation with climatic conditions and leaf development. It doesn’t occur in other species and it isn’t always predictable. “It’s a nuisance,” says Will Hartfeldt, president of Source Tech. “However it does seem to be positively correlated with efficacy of the treatment.”

Though treatment is reported to last as long as four years, Little keeps trees on a 3-year rotation for added security. Encouraged by the success of the past several years, AAA Tree Service injected about 70 trees this year.

Arborists should not go to conferences or seminars expecting someone else to decide for them if they should use tree injection. The responsibility is theirs and theirs alone.
Response requested

Stuck between a rock and a hard place. It's not fictional, so the names will remain anonymous. Your boss sends your crew on a storm damaged white pine. (It's) 90% uprooted and hung up in a white pine, which is now putting a big strain on the service wires going into a property. When I requested the power company's involve-

ment, the boss then said the power company .... doesn't have the time to get to the site as fast as the boss would like, but is sending one of their tree crews to remove the tree. The boss comes back with the reply and attitude that I may have just cost our company money. The only decision is obvious, but I would like to hear from my fellow arborists and see what their decision would have been.

Anonymous arborist

(We at TCI have agreed to keep the name of this writer and his company confidential. We normally would not publish an unsigned letter, but we decided that a break with policy was justified in this case.)

Clarification please

I enjoyed Don Blair's article on rigging (July issue) and am glad to see the refinement of techniques taking hold in the industry.

As regards the photo at top left on Page 5, shouldn't the shackle be hung on all three round turns rather than single strand as shown?

Scott Cullen
Stamford, Conn.

Editor's response: We checked with Mr. Blair. The reason for suspending the shackle and pulley from the round turn that does not comprise the square knot is two-fold. The remaining two round turns form an equalizing cinch on the tree trunk, virtually eliminating the chance of the false crotch slipping. Also, strain on the knot is reduced because some of the load force is taken up by the friction of the three trunk wraps.

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Professional Pruning

By Dr. H. Dennis Ryan III

During the last 20 years there have been considerable changes in how professional arborists prune trees. In the past, the tree crew leader emphasized the importance of making "flush" cuts. Most of us at one time or another were sent back up the tree to remove a "coat hanger" or "rabbit ear" that was left when making a poor pruning cut. When we were pruning with hand saws, our flush cuts were actually collar cuts and the trees callused over well. With the advent of lightweight chain saws in the 1960s, our flush cuts became much flusher and started to cause damage to the tree. Dr. Alex Shigo examined pruning cuts and developed a cut that is less damaging. By working with the tree's natural defenses against decay, arborists now remove the branch from the tree without cutting into the trunk of the tree. This natural target pruning does not lead to the internal defect problems associated with flush cuts.

Natural target pruning requires that the arborist be able to identify the branch bark ridge (BBR). The BBR is the flare of wrinkled bark at the junction of a branch. By making the cuts at the BBR, we can take advantage of the natural protection boundaries that the tree will set up.

Codominant stems are stems that originate at the same point and are about the same size, not a trunk with a branch. A codominant stem can be either wide-angled or tight with included bark. When it is necessary to remove one of the codominant stems, keep in mind that codominant stems do not have a protection boundary the way a branch does. But if a good pruning cut is made there will be little defect, especially if the stems are small.

In most cases pruning off branches is accomplished with three cuts of the saw. In addition, large branches will have to be supported with a lowering rope. By using three cuts instead of just one top cut, we can eliminate any ripping of the bark down the trunk of the tree. Some species are susceptible to bark rips, which are common in the spring if the arborist is not careful.

How much to prune

Some tree companies have a tendency to prune out too much live wood from the tree. Overpruning can be extremely damaging, resulting in sunscald, excessive suckering, a loss of photosynthetic area and even the death of the tree. Many arborists and customers feel that since prunings are spaced over a long time the tree should be extensively pruned. This is incorrect and can cause serious problems.

Removing dead and weak wood will always benefit a tree, but removing too much live wood removes leaves that are necessary for photosynthesis. Most arborists recommend that no more than 25% of the live wood be removed from a tree at any one time. If a tree needs extensive corrective pruning, do it over a two- or three-year rotation. The end result will be a healthier and better looking tree.

Pruning methods

All tree and shrub pruning involves three general types of pruning: basal, heading back and thinning out. All three types of pruning will be used on some plants while only one type will be used on others.

1. Basal—Basal pruning is the removal of old stems at ground level and is a common practice on shrubs that have a multitude of stems originating from the ground, such as Red Twig Dogwood and Forsythia. The size of the shrub can be controlled by setting up a pruning rotation. Once a shrub has reached a desired size, it can be maintained by pruning out the old-
est stems at ground level. This can be done yearly or every two or three years, depending on the location of the plant. Usually one-fourth to one-third of the oldest stems are removed during pruning. Basal pruning leaves the shrub with a natural looking appearance that yields more flowers or glossy stems.

2. Heading back—Heading back reduces the size of a plant in height and spread. There are several heading back methods that can be used, but most destroy the natural shape of the plant. The following pruning techniques are all classified under heading back.

a. Topping is the severe reduction of stems (trunk, branches) without consideration for the plant. Topping leaves large branch stubs without foliage, and decay, excessive suckering and sunscald commonly result. Since topping almost always causes severe damage to the tree, it is seldom done by professionals.

b. Shearing is used primarily on shrubs and hedges to create a formal shape and is similar to cutting grass. Shearing is used in settings such as topiary and hedge gardens, but is often overused on foundation plantings around homes, resulting in plants that are misshapen. A shearing cut is identical to a topping cut but is done on much smaller stems.

c. Pollarding is the cutting back of a tree’s branches to the same place each winter, resulting in a flush of spring growth. Unlike topping, pollarding is an ongoing process. Pollarded trees develop pollard heads—masses of callus tissue—at branch extremities. The growth is that of slender shoots or branches. This method of pruning is popular in Europe but is used sparingly for ornamental purposes in North America.

d. Drop crotch pruning is sometimes called natural pruning or crown reduction pruning. Drop crotch pruning is the removal of a leader or branch back to a lateral bud or branch. While drop crotch pruning is considered heading back, it is the preferred method if a tree needs to be reduced in size.

The National Arborist Association standards recommend that the leader be drop-crotched to a lateral branch that is at least one-third to one-half the size of the leader being cut.

All of the heading back techniques reduce the overall size of a tree. If a tree has to be reduced, the drop crotching method is preferred over topping or shearing. While some drop crotching will open up a tree, the long-term result is usually a bushier tree.

3. Thinning out is the removal of lateral branches back to where they originate...
on the parent system. A well thinned tree will allow air to flow through the tree but it will not look as if it’s been pruned. A thinned tree maintains its natural shape and the foliage necessary to carry on photosynthesis. When a tree is pruned using the thinning technique, the height and spread of the tree are not reduced.

Most professional tree pruning can and should be accomplished using the thinning techniques and not heading back methods. The thinning technique will produce a healthier tree with less decay and suckering. The pruning rotation will also be longer when a tree is thinned out as compared to any of the heading back methods.

Pruning categories

All tree pruning is not the same; what is considered by some to be a light pruning may be considered excessive by another. In order to contract professional tree pruning and other arboricultural work, everyone needs to be bidding on the same type of work. A national committee of recognized tree experts is working on a consensus standard for tree care practices. Known as the American National Standards Institute (ANSI) A300 Standard, this document should be available next year.

Meanwhile, everyone selling or contracting out any tree work should refer to the NAA’s industry standards for arboricultural work practices, including pruning. A complete set of standards is available from the NAA office.

As an example, suppose two tree companies are asked to bid on the pruning of a large pin oak in a park. Company A looks at the tree and decides to prune out only the dead wood, which would require three man-hours of work. Company B looks at the same tree and decides to prune out the dead wood, the sucker growth and to elevate the lower branches over the sidewalk, requiring eight man-hours of work. While Company A submits the lower bid, it is obvious that the two companies were not bidding on the same type of pruning. By using the pruning standards to create contract specifications, this type of confusion can be avoided.

The NAA pruning standards provide for four classes of tree pruning designed to accommodate varying situations. Classes 1 through 3 use primarily the thinning techniques while Class 4 is crown reduction. Class 1 is called Fine Pruning, Class 2 is Standard Pruning, and Class 3 is Hazard Pruning. All three classes use the same thinning technique of pruning but Class 1 removes more wood than Class 3.

The pruning classes are the same in how the pruning cuts are to be made, the equipment used and any disease problems treated. The differences lie in the sizes and number of branches to be pruned.

Class 1, Fine Pruning, involves pruning...
branches one-half inch (1.25 cm) in diameter. It is recommended for premium-quality work with an emphasis on aesthetic and structural integrity. This is what some would call “estate” pruning. This type of pruning is time-consuming and requires great skill on the part of the arborist. With Class 1 pruning, girdling roots are also treated. Many arborists who do Class 1 pruning remove too much of the outside canopy. This can lead to excessive suckering and sunscald.

Class 2, Standard Pruning, involves pruning branches one inch (2.5 cm) in diameter, and is recommended where aesthetic considerations are secondary to structural integrity and tree health. It leaves a tree looking natural and there is seldom a problem with overpruning. Most of the pruning done on residential and commercial property is Class 2.

Class 3, Hazard Pruning, is the removal of branches that could be a hazard to life or property and involves pruning branches two inches (5 cm) in diameter. This is the most economical class of pruning. A tree that would take five hours to prune as a Class 1 would take three hours to do as a Class 2 and only one hour as a Class 3. This type of pruning is commonly used on street trees, golf courses and in parks.

Failure to warn the property owner of a potential hazard could leave the tree company open to a liability claim, so always put your recommendations in writing and keep a copy for your records.

Classes 1, 2 and 3 all use the thinning technique, enhance the health of the tree and leave it more natural looking.

Class 4, Crown Reduction Pruning, uses the drop crotch method to cut back the size of the tree and does not thin out the tree. Class 4 pruning usually has to be used when someone has planted the wrong tree on a site. The tree then outgrows the area—under utility wires, on a narrow street, close to a building—and either has to be removed or reduced in size. Class 4 pruning is the preferred method to use if a tree needs to be reduced in size, but should be avoided otherwise.

Summary

The amount of pruning will depend on the class of pruning called for and the species of tree. The pruning cuts should be clean branch collar cuts made with a sharp saw.

If the branch is large or if you are over something that could be damaged, rope off the branch.

New climbers often have a difficult time deciding what should be pruned out of the tree. Start by pruning out the dead wood, then remove any suckers or watersprouts. Look the tree over for weak crotches, rubbing branches or decay. Last, check to make sure that the tree is clear of any roof or TV antennas. Then stop. You can always go back and prune more, but you can’t put it back once you cut it off.

One of the best things that an arborist can do is to go back and look at trees and shrubs that were pruned last year or the year before. What you did right and what you did wrong will be obvious. Learn from your experience.

Dr. H. Dennis Ryan III is head of the arboriculture program at the University of Massachusetts at Amherst. He will be one of the speakers at TCI Expo, December 5-7, in Columbus, Ohio.
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OSHA & Electrical Safety

By Brian Barnard

A non-qualified tree trimmer is allowed "to work in trees closer than 10 feet to power lines so long as that person or any object he or she may be using does not come within 10 feet of a power line," the Occupational Safety and Health Administration said in an issued statement. The directive, on general industry standard 29 CFR 1910.331, also known as the "Electrical Safety-Related Work Practices" standard, was sent to OSHA compliance officers to help clarify the federally mandated 10-foot rule for tree work around electrical conductors.

The directive stems mainly from National Arborist Association recommendations regarding the right of qualified commercial arborists to work around energized power lines. Utility line clearance contractors are regulated by a vertical standard, 1910.269, which is under revision.

The original draft of the general industry standard failed to properly address the practices of the commercial arborist. The NAA and other groups encouraged OSHA to clarify the definition of "qualified person" in section 1910.331. The original wording required tree trimmers to have a lineman's knowledge of electric utility generation equipment. The final rule recognizes that with proper training in electrical hazards recognition and avoidance, tree workers are qualified by being "familiar with construction and operation of the equipment involved."

The standard recognizes qualified tree workers as those who have adequate training to be able to perform tree work within 10 feet of electrical conductors. Thus, a qualified person employed by a commercial tree company can perform line clearance work that may be part of his/her normal work.

NAA met with OSHA officials early last year and submitted pre-hearing and post-hearing legal briefs on the proposed general standard. The goal was to avoid undue hardship on the arborist while maintaining a safe work environment for tree trimming near electrical hazards. Through expert testimony at OSHA hearings, NAA gained concessions for residential/commercial tree workers and line clearance contractors, ensuring their right to perform necessary tree care practices around electrical wires.

As of August 6, appropriate electrical hazards training was required for persons working closer than 10 feet to power lines. While performing an inspection, compliance officers will evaluate the training practices of the employer for qualified and non-qualified employees.
Marketing
Preparation A Plan Is The First Step

By Duane A. Pancoast

Marketing is often the weakest link in a commercial arborist’s operation. Few operate with a written marketing plan. Even fewer know what marketing actually is. But arborists are not alone. Many other service organizations are also confused about marketing.

Definition of marketing

Actually, sales and advertising are both components of a marketing program. Marketing is the process of creating demand for your service and must involve decision-making. First, determine what services you want to offer and what services customers will buy. Then communicate the benefits of your products or services and create the means to obtain them.

Deciding on services

This first step involves research—internal and external. You have to know what the market wants and what you can best deliver economically. We recommend beginning with a self-analysis of where you are now and where you want to be a year from now. The Pancoast Concern has created a self-analysis questionnaire that asks you to consider image, position in the marketplace and major competition from your viewpoint. The next question asks whether your business bears out this perception. An exercise follows to help you determine if the company really is as perceived. This information will be used to increase the respondent would like to see. Sales and communications efforts can then be targeted to those segments whose share should be increased.

Outside research can be expensive market research, or it can involve focusing your knowledge and that of your sales and field people to determine what’s selling. Basic research can be done by your receptionist asking a series of questions when people call, or you can enclose a postpaid survey with your next newsletter.

Communicate benefits

Communications is advertising and public relations, but you must go beyond telling tree owners what they want to hear. You also must tell them what they need. That’s education.
Companies with ongoing communications will enjoy continuous success with just economy-induced ripples instead of the drastic fluctuation some arborists are experiencing now.

Newsletters are accepted, well-read, effective communications tools. Yet, some companies decided not to publish their newsletters this past spring. Some blamed it on the economy, others claimed to have too much work. Either approach is wrong. Not publishing a newsletter that customers and prospects expect diminishes their confidence in your company.

A simple flyer or even a letter will let customers know you want their business. The bottom line is that communications should be consistent.

If you change direction as a result of your marketing plan exercise, you will need brochures describing your new services. You will also have to develop sales training programs and incentives to reorient your sales people. They will be the key to your successful transition.

Writing a marketing plan
Getting to this point will be your major hurdle. As a hands-on person, you probably don’t like going through this number-crunching exercise. However, it will be most revealing and could mean the difference between success and failure for your business.

Delivering services
While some consider service delivery as production, it is also marketing. This is where the public has first contact with your company. What is your image on the streets? On customer property? As a corporate entity? Are your trucks clean and easily identified? Are your employees uniformed? Are your office people helpful? Do your sales reps respond quickly?

In most tree care companies, the sales rep doubles as field supervisor. This can open many doors. While on a property, the rep can sell more work and talk to neighbors and sell even more work. You must determine if this is happening, or if the sales reps are only responding to sales calls. Even if they are just responding to calls, are they responding quickly? This is all part of marketing.

Duane A. Pancoast is president of The Pancoast Concern, Ltd., a public relations and advertising firm in New York.
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Programs Spur Interest
This Decade May Be A New Environmental Era

By Reinee Hildebrandt

The decade of the '90s may become known as the new environmental era as the president's America the Beautiful program spurs interest and involvement in urban forestry programs.

America the Beautiful (ATB) and statewide urban forestry initiatives are being administered through the USDA Forest Service, State and Private Forestry Program.

State forestry programs were first authorized by the 1929 Clark-McNary Act, which allocated funds for cooperative fire control. The legislation also called for a study of tax laws, distributed seeds or planting stock and provided funds to acquire forest land under certain conditions. In the mid-1970s urban forestry received funding to implement statewide programs.

This year the Small Business Administration Natural Resources Tree Planting Initiative was administered by state forestry agencies.

State and Private Forestry programs can be part of the Department of Natural Resources, the Department of Conservation's Division of Forestry or another multi-disciplinary department in each state. A state forester administers the State and Private Forestry Program, which includes urban forestry, wood utilization, fire prevention, cooperative forest management, state conservation nursery operations, information and education, forest stewardship and forestry incentives.

Role of NASF
All state foresters belong to the National Association of State Foresters (NASF). The purpose of NASF is to establish forest policy, discuss issues relevant to the growth of the forestry profession and strengthen statewide programs.

During its early days, NASF's major concerns were forest disease and fire protection. Today, social and political issues more frequently occupy NASF's agenda, and the organization's focus since 1970 has been on urban forestry.

Municipal foresters, commercial arborists, utility arborists and the general public often express an interest in becoming more involved in urban forestry programs, but the extent of that involvement depends upon programs within a particular state.

Allocations for state urban forestry/conservation programs this year include funds for hiring a full-time state coordinator, establishing a council, working with volunteers and creating a statewide plan. Many states have requested help from foresters, arborists and the general public as they fulfill these requirements.

Additional funds have been provided for
education, technical assistance and tree planting demonstrations. Municipal foresters and the general public or tree board members should check with their state forester to determine the type of program being implemented in their state. Several states requested grant proposals from communities for urban forestry projects. Other states provided educational programs and developed urban forestry materials.

**SBA program**

Another program that has made a major impact on urban areas is the Small Business Administration Natural Resources Tree Planting Initiative. The program provides funds for contracting with small businesses to plant trees on land owned or under the control of states or municipalities. The funds were distributed according to a complex formula that takes into account the population of the state applying for the grant and the amount of matching funds that state is willing to provide. Across the United States state and local funds provided $21 million while the federal program provided $14.92 million for the program.

In addition to tree planting programs, the SBA program provides funds for municipal foresters to enhance current programs. In some states utility arborists can develop creative programs to help improve the community forests on public utility rights-of-way.

With the implementation of America the Beautiful and SBA, many statewide urban forestry program administrators are no longer able to provide the hands-on, one-on-one assistance. There is a need for expanding the statewide program urban forestry infrastructure as well as creating partnerships with green industry constituents.

Reinee Hildebrandt is program administrator of Urban Conservation, Illinois Department of Conservation—Division of Forest Resources.
National Grove Of State Trees Takes Root

The National Grove of State Trees was inaugurated recently at the U.S. National Arboretum in Washington, D.C., as saplings were planted from Arkansas, Delaware, Georgia, Illinois, Iowa, Maryland, Nebraska, South Dakota, Texas and Virginia.

Trees from the remaining states will be planted and dedicated over the next two years. The grove, which is scheduled for completion in 1993, will eventually contain 38 species of trees.

The vision for the National Grove of State Trees is to provide a place where people can see state trees growing and living together in a common environment. It will be a testimony to the role of state foresters to work together in a partnership with other agencies and the public to enhance awareness of the environment. It will also be a gene pool source for native trees.

The program is sponsored by the U.S. Department of Agriculture, the Agricultural Research Service of the USDA National Arboretum, the USDA Forest Service, the National Association of State Foresters and the American Forest Council.

Each state has been allotted 10,000 square feet to plant trees in groves. The number of trees depends on the estimated size of the tree at maturity and outlook for survival in the region. The trees are grouped according to the soil and drainage of the site, the shade of other trees and other factors. Some substitutions were made due to differences in climate.

According to Terri Bates, the Washington representative for the National Association of State Foresters, the 30-acre site for the groves will be set up like a park, with grid-like natural paths designed by a landscape architect and plaques identifying the state and the trees. The paths and plaques will be installed at a later date.

The Davey Tree Expert Company, in Kent, Ohio, was instrumental in preparing the site. John Dingus, manager of the Northern Virginia territory, spent almost an entire week with an 8-person crew clearing the site and relocating almost 100 trees and shrubs into other parts of the arboretum.
The AS300 Series overcenter aerial devices from Altec Industries, Inc., feature four models in working heights from 41 to 44 feet, with side reach up to 30 feet. Standard features include a lower boom insert, continuous rotation with extended shaft for manual rotation, mechanical platform leveling, manual platform tilt, and many others. A full range of options is available. For further information, contact Marketing Department, Altec Industries, Inc., P.O. Box 10264, Birmingham, Ala. 35202. Phone: 205-991-7733.

Asplundh Manufacturing Division introduces a new multi-use heavy-duty vehicle. The Multi-Loader combines wireless remote control operation of a swing boom, winch and 100-square-foot all steel tilt bed with 20-inch-high steel drop-down sides and steel, tail-mounted roller for one-man loading of 3000 pounds over either side and 5000 pounds off the rear without outriggers. Many options available. For further information contact Asplundh Manufacturing Division, 1550 Asplundh Ave., Creedmoor, N.C. 27522. Phone: 800-331-1038.

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In mid-August, 17 students from the Urban Tree Management program at Paul Smith's College installed a lightning protection system on a 75-foot hemlock that stands near a new outdoor classroom on top of a hill on the campus.

Paul Smith's College is located in the Adirondack Mountains in New York. Urban Tree Management is a two-year program that focuses on the skills and knowledge that technicians entering the field of arboriculture will need. Some of the students continue at four-year colleges to receive a bachelor's. The summer program includes work projects and field trips that expose the students to many facets of the tree care industry. Lightning protection for trees is just one of the subjects included in the program that offers hands-on training.

Mornings were spent in the classroom as Robert E. Cripe, president of Independent Protection Company, Goshen, Indiana, discussed various topics pertaining to lightning protection. In the afternoon, the students and their instructor, Professor Randall Swanson, moved outside and installed a complete lightning protection system in the pre-selected tree. The equipment used in this particular tree consisted of two standard air terminals located in the uppermost part of the forked-top tree, one standard downlead cable, three miniature branch air terminals in the highest branches, and one 10-foot ground rod driven out beyond the drip of the tree away from the root area.

Swanson labeled the lightning protection seminar a "valuable component" of the summer session. The summer program also included a street tree inventory project, a Mauget injection seminar, and various field trips including the New York State Tree Nursery and the Montreal Botanical Gardens.

This article was submitted by Robert Cripe, president of Independent Protection Company in Goshen, Indiana.

Do you have a story for From the Field? TCI will pay $100 for published articles. Submissions become the property of TCI and are subject to editing for grammar, style and length. Entries must bear the name of the company and a contact person or they will not be considered for publication. Articles and photos must be received by the first day of the month for the following month's issue.
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