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Concentrating on Our Strengths ...

I run into people right now who are on a search for answers. They’re trying to decide what to do with their lives, their businesses, how to ride out this economic cycle, and make accurate predictions for the future.

I’m also running into people who don’t seem to be having as much fun. For all the emphasis on family, family time, staying close to home, and paying attention to what matters, people don’t seem to be benefiting from this perspective. I’ve been wondering about why are people floundering?

I was recently at a training symposium and the message for associations was to “hunker down.” Stay the course with the core services. Do what you do best – don’t reinvent. But stay alert. Don’t miss out on opportunities that could benefit your members in the long term.

To a certain extent, I’m not sure how that advice differs from what you do on a normal basis – provide quality service to a core group of people whom you care about. The primary difference may be the resources that are less abundant for all of us than they were a year ago.

So what does that tell us? It tells us that the most important thing we can do in life and in business is to focus on our strengths. The more effort we put into doing what we do well and allowing the people around us to do their bit well, the better off the whole is. That is true whether you are talking about your business, staff or family. When we focus on our weaknesses, we become negative. When the group focuses on strengths and possibilities, it’s a positive conversation about opportunity and what we’re going to do together.

And therein may lie the answer to some of the heaviness in our society. We’ve bred a society of independence in the past 25 years. It’s all about me. Remember the “Me Generation” of the ’80s? Then, it all became about the wildly ridiculous financial times everyone tried to ride, expecting it to last forever. Meanwhile, the connected generation took over. Everyone got online and became good at “cocooning.” We would talk to people around the world, but didn’t know our neighbors. And during this time, as we were become even more wildly wealthy as a nation, our charitable giving dropped to the lowest levels historically.

Then tragedy struck. The economy tanked, and people who were alienated from each other began to reach out. And it felt good. The problem is, after about three months, “normal” returned and the heaviness began to settle in. We started focusing on ourselves and not the community. We heard one negative after another, thanks to the media, instead of the possibilities. We rejoiced in everything – expenses in our businesses, good times traveling, investments, and our dreams. After the first initial outpouring, the rest of the world has begun cocooning, too. Just ask the people dependent upon tourism to and from the United States.

It’s time for the green industry to start concentrating on our strengths. First, we need to do it individually. We are part of a great industry that provides tremendous service, and it’s full of people who love what they do. We need to recognize that we are some of the fortunate people in this world who get to make a living doing something that we enjoy, and we need to start having fun again – setting the tone for that.

Then, we need to reach out to our staffs and build our future on what we do well as a team. We talk a lot about the employee recruitment and retention challenges. However, if we don’t set the tone for a great work environment and let the “heaviness” be the overriding feeling in our offices and out in the field, getting people to join us is not going to get easier.

We are a critical part of the community. Our visibility with our customers, local political and business communities, and environmental organizations around us needs to be high. We must be credible and professional. We need to be part of the rally for the future, not the negative drain. Let’s paint the picture for those around us of a vibrant industry, with professional people, who care about our place in the community. Let’s be a strength as we go into 2003.

Cynthia Mills, CAE
Publisher

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Mark this in the annals of arboriculture: The days of indiscriminate, one-size-fits-all pest control are over. Homeowners and business owners, as well as those city and county leaders who make urban forestry decisions, are growing ever more distrustful of chemicals. They’re embracing a more holistic approach to every discipline from health care to grocery shopping. In the green industry (and in agriculture, too) this “new” way of thinking is apparent in the focus on integrated pest management and plant health care.

(For the sake of this discussion, let’s think of these two concepts – integrated pest management, or IPM, and plant health care, PHC, as tightly woven plant-management systems. Because it’s difficult to adhere to one without a tip of the hat to the other, we’ll simply think of IPM as an integral component within the grander vision of PHC.)

Right out of the gate, let’s talk about what IPM isn’t. IPM isn’t a touchy-feely turning of the back on all things chemical, nor is it merely something that will be of interest to those individuals with Peace signs and “Save the Whales” bumper stickers attached to their VWs. IPM is not the end of pest control as we know it. It isn’t too cost-prohibitive for the “little man.” And it isn’t a 100 percent, sure-fire solution to every insect problem.

“IPM is not a new concept,” explains Dr. Diane Alston, IPM coordinator for the State of Utah. “It was developed in the 1960s. It is a common-sense approach to pest management. It advocates approaching pest control situations with solid knowledge of the plant and pest systems and then selecting management options based on what is most likely to succeed for the current situation.”

Knowledge is what IPM is all about – not botanically derived products and human alliances with “friendly” insects. In the long run, IPM is likely to reduce the amount of pesticides you use, but it won’t require you to rid...
your storage sheds of everything that’s created in a laboratory. Rather, a properly executed IPM program will get the most of your chemical pesticides, reserving them for those times when they’re most effective.

**Is it profitable?**

As dedicated as you may be to the environment and the urban forest, the primary reason you’re in business is to make money. So, there’s no shame in saying that if an IPM program is unprofitable, it won’t last very long. What makes it profitable? Education is the key element in determining whether an IPM program sinks or swims, because a customer base can’t demand what they don’t fully understand and appreciate.

Gary Huntsberger, plant health care manager for Antietam Tree & Landscape in Hagerstown, Md., is situated in one of those areas where the public is yet to be enlightened as to the merits of IPM.

“Our IPM program started off good but has stumbled a little,” he explains. “People still are not sure what they get for their money. Our IPM program is (to) inspect, monitor and treat as needed. We have incorporated fertilization, Merit and Vapor Guard, but still can’t seem to increase our base. I don’t think there is enough being done to educate the public about how IPM is supposed to work.”

On the other hand, Broccoli Tree & Lawn Care in Rochester, N.Y., is riding the waves of several years of educational efforts – efforts put forth by both themselves and academia.

“It was hard to educate people at first,” explains Steve Desmond, senior IPM specialist, “but it’s much easier now. Our company puts out three to four newsletters per year, which helps get the message across. And the Rochester community is relatively well-educated in terms of IPM, due largely to the efforts of Cornell University’s Cooperative Extension Program.”

So, if you decide that IPM is a path you should take, it would be wise to see how much education has been pumped into your service area. Chat with your current clients to get a feel for their interest level. If folks don’t seem to be well-acquainted with the concept, consider contacting nearby universities to see if educational resources such as brochures or pamphlets are available, or develop your own.

**First things first**

Although some may be tempted to trade their broad-spectrum pesticides for horticultural oils and preying mantises and mistakenly call this a first step, a working knowledge of entomology is what is needed for a successful program. You *must* be able to identify the insects you’re battling and have an understanding of their biological functions.

“The first step in any IPM program is monitoring,” insists Desmond. “You have to know what you’re looking for – what pests are active during which times of the year. Your local extension office will have some great resources for equipping you with this knowledge, and then you’ll be able to time your treatments effectively.”

Fortunately, it isn’t necessary to know intimately every bug that might affect a client’s trees. If you know enough about a handful of the more common ones, you’ll be set to use that prowess to overcome the pest in question.

How you gain the entomological knowledge you’ll need will depend on where you’re located and how much time you have available, certainly, but even if you can’t take a full-length class at this time, you can still find useful tools. Publications available through the International Society of Arboriculture, National Arborist Association or other green industry organizations to which you belong can be helpful. Scan upcoming conference schedules for PHC/IPM seminars. Subscribe to
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extension newsletters, or spend some time surfing the Internet for insect information. Each state also has an IPM coordinator (listed at http://www.reeusda.gov/agsys/ipm/coordinators.htm) who should be able to get you on the right track.

Once you have a foundation of know-how, be sure to pass this down to your employees through scheduled training sessions. Plant health care is a philosophy that will fall short if your team doesn’t adopt it, too. As for establishing a training regime, Alston recommends the inclusion of the following elements:

- proper diagnosis of pests, as well as detection of non-organism problems such as nutrient deficiencies and heat/cold stress;
- monitoring techniques for the most common pests;
- basic information on the life cycles of these insects so that treatments can be optimally timed;
- available treatment options;
- relative effectiveness, proper timing and estimated cost of each option.

The big picture
The traditional approach is reactionary: One sees a tree infested with tent caterpillars or leafminers and then sprays to solve the problem. With a PHC program in place, though, you should be able to head off a lot of these pests at the pass, thereby saving yourself considerable trouble and expense down the road. Once you’re equipped with knowledge of the insects, you can begin making things harder for them, beginning with the decisions you make before a tree is even planted. If you know that lerp psyllids have been getting closer and closer to your service area, for instance, you can steer clients away from planting eucalyptus species. Other common-sense decisions might include choosing the trees that thrive best in a specific growing situation or picking varieties that are cultivated to be resistant to threats. Remember, a healthy tree can fight a great many of its own battles.

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and proper care (fertilization, irrigation, pruning, etc.),” emphasizes Alston. “Stressed trees and plants are most likely to be attacked and succumb to pests. If stress can be avoided, then most pest problems will not materialize.”

When problems are detected, determine whether or not your involvement is necessary. Is it a pest that will go away on its own after a few weeks, with little or no damage to the tree? If that’s the case, then no action may be the best action. Can conditions be modified through mulching, watering or fertilizing to give the tree an advantage? You might choose to leave the pesticides in the shed. Is it an insect that can be treated with a highly focused method, such as removing and destroying the affected branches or treating certain trees by trunk injections? If so, there’s no point in spraying every tree in a 5-mile radius.

In some situations you must return to the old modus operandi and attack the pest with full force, but the more you understand the notions of plant health care, the fewer and farther between these instances will be.

IPM and PHC require more mental modifications than physical ones, and misconceptions about these systems are still widespread. On the most basic level, the adoption of these concepts boils down to understanding the insects, understanding the trees, understanding your environment and understanding your clientele. Once you have all this knowledge at your fingertips, you can effectively select those options that will be most beneficial, without significant waste.

All the evidence would indicate that IPM is the future of pest control. If at all possible, it would be in your best interest to take hold of it here, in the present, perhaps even before your competition does.

Phillip Meeks is a freelance writer whose articles have appeared in more than 30 green industry publications.
In past years, the green industry has become somewhat reliant on pesticides in its attempts to effectively manage arthropod (insect and mite) pests. Even though these materials are valuable tools to be used in the maintenance of healthy ornamental plant material in landscapes, their improper use has been proven to be environmentally detrimental and economically unjustified. Poorly timed applications, blanket spraying, and inaccurately identified key arthropod pests are some examples of specific practices and areas of knowledge that can be addressed through an integrated pest management (IPM) educational program.

Late in 1990, while recognizing these areas of educational need, ornamental horticulture extension agents in southeastern Pennsylvania formed a regionally based grassroots IPM research group that solicited input and feedback from growers, landscape managers and the industry. The purpose of this group, known as the Southeast Pennsylvania IPM Research Group, is to provide education and information about IPM to the ornamental horticulture industry in southeastern Pennsylvania, Delaware and other eastern states. These goals are accomplished through the following activities:

1. Conduct applied field research in order to evaluate IPM practices on woody ornamental plants;
2. Assist in conducting IPM educational programming;
3. Provide a clearinghouse for IPM educational information, methods and practices;
4. Encourage the practice of IPM among other horticultural businesses in the area.

Cooperators

The initial group consisted of 11 cooperators from southeastern Pennsylvania. The number of cooperators quickly grew to 27, and now includes production nurseries, arboreta, residential communities, arborists, university landscapes, and city parks in southeastern Pennsylvania and Delaware.

These cooperators scout their properties daily from March 1 to Oct. 31. Each cooperator maintains a weather station housing a biophenometer that permits monitoring and recording of weather data in the form of growing degree days (GDD). Early each week, the cooperators send a fax to Penn State’s Montgomery County Cooperative Extension office. This fax contains information for the previous seven days, including total GDD accumulation for
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Some case histories

The following examples are of a few selected key arthropod pest species for which the group has recorded GDD data and plant phenology observations.

Azalea Lace Bug, *Stephanitis pyrioides* (Scott)
This common pest of azalea overwinters as an egg inserted into the lower leaf vein. Observations were made on "Delaware Valley White," "Mother’s Day," "Plumleaf," and "Schilpenbachii" cultivars of azalea, to name a few. The hatch of first generation nymphs occurred in the range of 181 to 251 GDD. Full bloom of horsechestnut (*Aesculus hippocastanum*) may be an important plant phenological indicator for this event. The average accumulated GDD for hatching of first generation azalea lace bug was 202 GDD. First generation nymphs were active on host plants in the range of 240 to 561 GDD. The average accumulated GDD for the nymphal stage of first generation azalea lace bug was 318 GDD.

Hawthorn Lace Bug, *Corythucha cydoniae* (Fitch)
This key pest occurs throughout most of the United States. Observations were made on cotoneaster, hawthorn and serviceberry. It overwinters as an adult in protected areas. These adults were observed on host plants in the range of 196 to 472 GDD. Leaf bud break of crapemyrtle (*Lagerstroemia indica*) may be an important plant phenological indicator for this event. The average accumulated GDD for the overwintering adults was 349 GDD. Eggs laid by overwintering females that give rise to the first generation were observed in the range of 222 to 463 GDD. The average accumulated GDD for these eggs was 374 GDD. First generation nymphs were observed on key plants in the range of 889 to 1101 GDD. Full bloom of golden raintree (*Koelreuteria paniculata*) may be an important plant phenological indicator for this event.

Hemlock Woolly Adelgid, *Adelges tsugae* Annand
This key pest overwinters as a nymph on the host. Observations were made on Canadian hemlock. Females may lay up to 300 eggs in a single white ovisac. Eggs that started the spring generation were observed in the range of 0 to 349 GDD. Ten percent hatch of first instar nymphs of the spring generation occurred in the range of 185 to 364 GDD. The plant phenological indicator for 10 percent hatch of the spring generation is full bloom of white fringe tree (*Chionanthus virginicus*).

Hatch of 50 percent of the spring generation eggs occurred in the range of 242 to 367 GDD. The range of GDD observed for 100 percent hatch of eggs in the spring generation was 505 to 676 GDD. The average accumulated GDD for 100 percent hatch of first instar nymphs in the spring generation is 591 GDD.

Plant phenological indicators for 100 percent hatch of the spring generation include full bloom of smooth hydrangea (*Hydrangea arborescens*) or "petal" fall of kousa dogwood (*Cornus kousa*). Initial observations of first instar nymphs of the spring generation occurred in the range of 18 to 550 GDD. Egg hatch of the summer generation occurred over the range of 548 to 996 GDD.

Eastern Tent Caterpillar, *Malacosoma americanum* (Fabricius)
This pest overwinters as eggs in a mass on small twigs. Observations of this key pest’s activity were made on flowering crabapple, weeping Higan cherry, Japanese weeping cherry and black cherry. Hatching of larvae occurred in the range of 34 to 149 GDD. Full bloom of Cornelian cherry dogwood (*Cornus mas*) may be an important plant phenological indicator for this event. The average accumulated GDD for hatching of larvae was 58 GDD. The larval stage was active on host plants in the range of 80 to 534 GDD. Full bloom of flowering dogwood (*Cornus florida*), may be an important plant phenological indicator for this event. The average accumulated GDD for the larval stage of eastern tent caterpillar is 186 GDD.

When comparing the size of the larval stage and relating it to GDD, the data for the average accumulated GDD for larvae less than 12 mm in total length was 138 GDD. For larvae greater than 12 mm, the average accumulated GDD was 332 GDD.

Fall Webworm, *Hyphantria cunea* (Drury)
This key pest overwinters as a pupa inside a cocoon in the leaf litter around the base of host plants. Adults emerge in late June, mate, and lay eggs on the lower leaf surface of host plants. Observations of this pest’s activity were made on flowering crabapple, sweetgum, black walnut, birch, elm, and weeping Higan cherry. Hatching of larvae occurred in the range of 802 to 1517 GDD. The larval stage was active on host plants in the range of 543 to 3225 GDD. When comparing the size of the larval stage and relating it to GDD, the data for the average accumulated GDD for fall webworm larvae less than 12 mm in total length was 2012 GDD. For larvae greater than 12 mm in total length, the average accumulated GDD was 2447 GDD.

European Pine Sawfly, *Neodiprion sertifer* (Geoffroy)
This pest overwinters as eggs are inserted into host plant needles. Observations of sawfly activity were made on mugo, Japanese red, Japanese black, Scots, Swiss mountain and Formosa pines. Hatching of larvae occurred in the range of 47 to 181 GDD. Border forsythia (*Forsythia intermedia*), at petal fall and full bloom of Norway maple (*Acer platanoides*), may be important plant phenological indicators for this event. The average accumulated GDD for hatching of larvae was 92 GDD. The larval stage was active on host plants in the range of 69 to 484 GDD. Full bloom of flowering dogwood (*Cornus florida*) may be an important plant phenological indicator for this event.

When comparing the size of the larval stage and relating it to GDD, the data for the average accumulated GDD for European pine sawfly larvae less than 12 mm in total length was 162 GDD. For larvae greater than 12 mm in total length, the average accumulated GDD was 336 GDD.

Spruce Spider Mite, *Oligonychus ununguis* (Jacobi)
This pest species overwinters as eggs on the needles and twigs of host plants. Some observations were made on Canadian hemlock, juniper, Colorado blue, dwarf Alberta and Norway spruces. The hatch of the first generation occurred in the range of 56 to 408 GDD. Downy serviceberry (*Amelanchier arborea*) in full bloom may be a good plant phenological indicator for this event. The average accumulated GDD for hatching of first generation spruce spider mite was 172 GDD. Full bloom of horsechestnut (*Aesculus hippocastanum*) may be an important plant phenological indicator for this event. First generation nymphs were active starting at 80 GDD. Flower bud break of red maple (*Acer rubrum*) may be an important plant phenological indicator for this event.
the season at that location, arthropod pests (including life stage) sighted during the week, phenological indicator plants and the plants' stage of development. Cooperator reports are entered into a computer database at the Montgomery County Cooperative Extension office, permitting timely generation of a report to the participating cooperators and to several hundred subscribers in five eastern states. Extension fact sheets for key pests are included with weekly reports when that particular insect or mite pest has been observed.

During the past several years, extensive training has been provided to these cooperators on scouting techniques, ornamental pest identification, and key ornamental arthropod pest management strategies. Each cooperator participates in three to five days of training each year.

Surveys were conducted to measure the impact of this extension education program on cooperator knowledge and pest management decision-making abilities. Ten percent of the cooperators reported good to excellent ability to identify key arthropod pests and to understand their life histories prior to participation in the program. That percentage increased to 94 percent following participation in the group's educational activities. Thirty-one percent reported good to excellent knowledge and use of IPM practices prior to participating in the program. That percentage rose to 95 percent. Fifteen percent reported good to excellent knowledge and use of growing degree-days (GDD) as arthropod emergence indicators prior to their participation. That percentage increased to 80 percent.

Evaluation data of the Southeastern Pennsylvania IPM Research Group's activities indicates that cooperators have decreased their total pesticide use significantly, increased their knowledge and use of IPM practices, and increased their knowledge of arthropods and arthropod life cycles.

Subscribers

More than 200 subscribers pay an annual fee for the newsletter/weekly scouting reports. Subscribers include landscapers, nursery operators, arborists, garden centers, grounds managers, researchers and entomologists. Since 1991, more than 40,000 weekly scouting reports have been distributed to subscribers in five Mid-Atlantic states and the District of Columbia. Surveys were conducted to measure the impact of this extension education program on a subscriber's knowledge and pest management decision-making skills. Thirty-three percent of the 1999 subscribers commented in an end-of-the-year survey that they used the report to:

♦ remind them of pest emergence;
♦ better implement a spray control program;
♦ confirm the timing of pesticide applications;
♦ train their employees on arthropod pest activity.

The subscribers reported decreases in pesticide use by 28 percent in 1992; by 36 percent in 1994; and by 41 percent in 1999. Subscribers receiving the weekly scouting reports increased time spent monitoring for pests by 23 percent in 1999. Subscribers have also stated that the information provided in the reports has proven helpful...
in their scouting and pest management strategies and techniques.

During the course of the joint effort, cooperators realized that their clients lacked an understanding of an IPM or plant health care program. As a result, the cooperators suggested the development of fact sheets that describe the components of an effective IPM program and target consumers. A booklet and a series of nine fact sheets titled, “Creating Healthy Landscapes,” are some of the most frequently requested publications from Penn State’s College of Agricultural Sciences. More than 232,000 copies of the individual fact sheets have been requested since 1998. The booklet and nine fact sheets are designed to educate consumers regarding good plant health care practices in landscapes. These fact sheets cover topics such as plant selection, proper planting techniques, plant health care, proper pruning, scouting and monitoring for pests, recognizing and conserving natural enemies, and effective pest management methods.

Additional educational outreach conducted by cooperators have included industrywide training for other green industry professionals and providing information to the public regarding IPM on woody ornamental plants.

Growing Degree Days

Effective woody ornamental pest management is not only dependent on our ability to accurately diagnose the causal organism, but also on our ability to predict when the vulnerable life stage of a pest will be active. Calendar method and experience is helpful, but when applying a management material with a short residual life, arborists need to determine precisely when a pest will be in a vulnerable life stage. Arthropod development sometimes varies from one year to the next by several days or even weeks. It is important for pest managers to consider additional methods of pinpointing the most accurate time to use effective management strategies.

The development of insects and mites is influenced by temperature — development will occur more quickly during warmer growing seasons and more slowly during cooler growing seasons.

Growing degree days (GDD) is an arithmetical conversion of daily temperature records to heat units. Although the concept of GDD has been recognized for many years, the base or threshold temperature is known for just a few of our key woody ornamental arthropod pests. The threshold or base temperature varies from one insect or mite species to another. Organisms that are active when temperatures are cool usually have a lower threshold temperature than those that become active during warmer months of the growing season. A threshold or base temperature of 50 degrees has been adopted by most woody ornamental pest managers. There are several methods — such as the average, modified average, and the modified sine wave — that can be used to calculate GDD based on minimum
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and maximum temperature. A simple method involves averaging the daily maximum and minimum temperatures and subtracting the base or threshold temperature from the daily average as described below:

Formula for calculating GDD:

\[
\text{Maximum + Minimum Daily Temperature - Threshold Temperature} = \text{GDD}
\]

If the system described above is to work, you need to collect maximum and minimum temperatures each day from March 1 through Oct. 31 and record the total cumulative GDD for your landscape. If the average temperature is below the threshold or base temperature for the day, a zero is entered for that day. In the early season, GDDs will accumulate slowly. As daily temperatures increase, GDD will accumulate more quickly. This information will help you determine when pest management actions should be applied. Remember to continue scouting your landscape to determine if treatment is indicated against a key arthropod pest population.

Plant phenology

Phenology is the study of periodic occurrences in nature and their relation to weather. The growth of plants is in part a response to an accumulation of heat units. Some examples of growth stages of plants that can be correlated to heat units include bud swell, leaf emergence/expansion, stages of flowering, or elongation of new growth in conifers.

Specific plant growth stages can be correlated to certain life stages of insects and mites. Length of day, other environmental factors, and different cultivars may affect specific events in a plant’s development, so that correlations of plant phenology are not as precise as the use of growing degree day information. Using plant phenological indicators is useful in establishing monitoring times and is more accurate than referring to calendar dates to time a pest management strategy. An example of the use of a plant phenological indicator would be the correlation of egg hatch of gypsy moth with the peak bloom of shadbush or serviceberry.

Data collection and observations of GDD and plant phenological indicators are useful in better timing of spray materials, if indicated. Referral to these two parameters during a growing season may greatly reduce the use of unnecessary pesticide applications in landscapes.

Conclusion

The activities, efforts and accomplishments of the Southeast PA IPM Research Group were described by a prominent ornamental entomologist as being unique to the United States. He thought briefly after making this comment, then retracted his statement and said, “No, I take that back. You’re unique to the world.”

The success of this truly unparalleled group of green industry professionals is due primarily to the untiring commitment of the cooperators, whose timely observations have contributed to our collective knowledge of many different key arthropod pest species of woody ornamental plants. This group stands as a model for other extension-education programs across the United States to emulate. This program has the potential for even greater impact on the ornamental horticulture industry if it were expanded into other areas of Pennsylvania as well as the northeastern United States.

The greatest barrier is the need to accept more cooperators into the program. Training new cooperators and managing and disseminating the increased data would require additional time and resources from extension coordinators. Perhaps as the value of this body of knowledge is more widely recognized, new innovative methods to expand on the accomplishments of this unique group will become apparent to others in the green industry.

Greg Hoover is an ornamental extension entomologist with The Pennsylvania State University.
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associated with an ambrosia-like fungus (hence their name). Ambrosia beetles prefer moist wood, including live trees. For evidence of ambrosia beetles, look for numerous toothpick-sized sticks of frass extending up to 1 inch beyond the bark. Pencil-sized holes appear when the sticks are broken off.

Some woodboring beetles vector the pine wood nematode that can kill the trees, primarily pine species, within three months. Pine bark beetles are particularly aggressive in yellow pine (Pinus ponderosa), eastern white pine (Pinus strobus), spruce (Picea spp.), and loblolly (Pinus taeda). A new threat that has been detected in New York and Illinois, the Asian long-horned beetle or starry sky beetle (Anoplophora glabripennis), prefers maple (Acer spp.), in which the emerging adults create round exit holes, 3/8 inch or larger in diameter.

Preventative measures that preserve healthy trees are the best controls for woodboring beetles because they target wounded and stressed trees. Such measures include pruning and removing deadwood, including stumps, proper fertilization and watering, and proper tree selection and location. Sometimes a spray or injection regimen may be recommended.

Holes made by other insects

Holes from some insects, such as bees and wasps, indicate there may be a tree problem. These insects do not cause hole damage, but merely occupy existing holes, since entry is readily available. Large carpenter bees (Xylocopa spp.), however, bore holes for raising their young in softwooded trees such as cedar (Cedrus spp.), white pine (Pinus strobus), poplar (Populus spp.), or redwoods (Sequoia sempervirens). Their holes average 3/8 inch to 1/2 inch in diameter but their tunnels may extend up to 10 feet, often turning 90 degrees within the first 1 or 2 inches. Usually there’s an exit hole somewhere. Carpenter bees bore mostly dead, treated or seasoned wood, but may bore through live wood also, primarily in a decayed section that is no longer chemically defensive. Although carpenter bees don’t eat wood, they will chew wood to make tunnels and may regurgitate the wood and other debris at the tunnel entrance, leaving unsightly stains beneath the hole.

Carpenter ants, Camponotus spp., don’t eat wood but will nest in decayed hollows excavated in primarily moist wood, including live trees. Ants enter and leave trees through natural openings such as knot-holes, insect tunnels, decayed sections or wounds. The ants deposit coarse frass near the openings as they clean the galleries that may extend into healthy heartwood. Sometimes the ants cut slits through which to exit. When the slits are no longer used, they become “windows” that are sealed with a clear substance. Carpenter ants don’t directly weaken a tree, so control measures usually aren’t needed except to further remove the ants from homes and buildings.

Termites eat wood and leave “dirty” galleries, as opposed to the clean ones excavated by carpenter ants. Also, many termites, such as the subterranean Formosan termites, sometimes infest live trees, but there are few external signs beyond occasional dirt or frass tubes appearing on the trunk near the base of a tree.

So, what do you do now that you have discovered holes in a tree and determined the cause? Once invasive insects and woodpeckers leave, the tree will naturally close its wounds unless damage is extensive. Don’t fill the holes with concrete or tar as these materials may inhibit wound closure and can seal in moisture, creating an environment conducive to pathogen build-up and decay. Digging out the decay also contributes to tree damage and rot and is not advisable.

Abiotic (Nonliving) Causes of Hole Damage

- Tree-climbing spikes
- Hall on wind-driven side
- Nails
- Vandalism, including carving
- Mechanical parts from trimmers and lawn mowers
- Diagnostic arborist tools such as increment-borers to determine a tree’s age and injection equipment for systemic application of chemicals and fertilizers.
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Doggett has added two new products to its line of specialty tree fertilizers and soil amendments. The Drought Special 15-15-20 is a formulation for application at times of drought and afterward. It contains ingredients designed to promote root regeneration and improve water-holding capacity. The Organic Based Tree Fertilizer 20-14-10 contains nutrients for clients who prefer an organic program. Ingredients include humate, yeast protein, kelp, iron yucca and sugar. Both of these formulations are for soil injection directly into the root area. For more information, contact Doggett at 1-800-448-1862.

Cummins 350hp ISL
Cummins Inc. recently introduced a new 350hp rating for its ISL engine, aimed at the 4-by-2 short-haul truck market. The new rating, with 1,050 pound feet of torque, has been developed in conjunction with Allison Transmission to optimize the engine/drivetrain package and deliver substantial weight savings of up to 800 pounds. The ISL is a fully electronic in-line 6-cylinder diesel engine with electronics designed to make servicing the engine easy. For more information, contact Cummins, Inc., at Box 3005, Columbus, IN 47202-3005 or visit www.cummins.com.

Minute Mount 2
Fisher has recently introduced an improved version of its snow attaching/removal procedure. The Minute Mount 2 system offers a built-in handle that disengages both connecting pins simultaneously when removing the plow.

2680 Beast Recycler with Thrower
Bandit's newly introduced Model 2680 Beast Recycler is now available with a hydraulic powered horizontal thrower. The thrower, mounted on the end of the 2680's 12-foot discharge conveyor, allows material to be loaded into end opening chip vans or to be spread out over a site. This new thrower is designed to ease the task of capturing logging slash from delimiters and processors that accumulates along logging roads.

Lower gear is flared twice as wide for easier drive-in alignment and a spring-loaded lift chain automatically retracts the lift arm. For more information, contact Fisher Engineering at 50 Gordon Drive, PO Box 529, Rockland, ME 04841; call (207) 594-4446; fax (207) 594-7256; or visit www.fisherplows.com.

Stump Hog SH400 Stump Grinder
FECON, Inc., has introduced the heavy duty, high-horsepower Stump Hog SH400. Designed for 175 to 250 hydraulic hp carriers, it features a 40-inch cutting wheel with 56 carbide-tipped teeth, designed to maximize production, service life, the carrier's fuel efficiency and operator visibility. Standard equipment includes an extra-smooth telescopic extension providing 24 inches of fore/aft cutting range and quick-attach brackets for easy mounting. For more information, contact Feccon, Inc., at 10350 Evendale Dr., Cincinnati OH 45241; call 1-800-528-3113; fax (513) 956-5701; e-mail fecon@fuse.net; or visit www.feccon.com.
Vermeer SC90 and SC130 Stump Cutters

Vermeer has introduced two new stump cutters. Featuring enough power to effectively remove stumps up to 3 feet in diameter, the SC90 (9 HP) and SC130 (13 HP) tackle stumps in locations where larger equipment is not accessible. Their slim width allows easy maneuvering of the unit into tight spaces. Lift handles, located on each side of the unit, make for easy two-person loading and eliminate the need for ramps. Both units feature smooth and long-lasting cutting wheels that can be changed in a few minutes using two 9/16-inch wrenches. Composed of 12 tungsten-carbide teeth, the cutter wheel is segmented into four sections. If one section becomes damaged, it can be changed without replacing the entire wheel. For more information, contact Vermeer Manufacturing Co. at PO Box 200, Pella, IA 50219-0200; call 1-888-VERMEER; or visit www.Vermeer.com.

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Monterey Garden Insect Spray is the company’s newest introduction into the insecticide market as a replacement for a number of Dursban and Diazinon usages. This product is based on the active ingredient spinosad, which comes from a naturally occurring actinomycete that was found in an abandoned distillery in Puerto Rico. It is produced by fermentation. Monterey Garden Insect Spray can be used on citrus fruit and nut trees; vegetables, lawns, and ornamentals. Also, it can be used as an individual mound drench to control fire ants. The product controls insects such as caterpillars and worms, thrips, leafminers, borers, sod webworms, and many others. It can be used on most vegetable crops within one day of harvest. For more information, contact Monterey Lawn and Garden Products Inc. at P.O. Box 35000, Fresno, CA 93745; call (559) 499-2100; fax (559) 499-1015; or visit www.montereylawnandgarden.com.

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Slawson Joins STAHL as VP of Marketing & Sales

STAHL is pleased to announce that John Slawson has joined the company as vice president of marketing and sales. He will be working out of STAHL’s Wooster, Ohio, headquarters.

Slawson will be responsible for the sales and marketing of all STAHL and ArborTech truck equipment products. Slawson’s previous experience includes Swenson Spreaders, a snow/ice equipment manufacturer in the Chicago area, where he held the positions of vice president of sales and then general manager. Prior to Swenson, he worked at Western Products in Milwaukee, Wis.

Slawson has a bachelor’s degree from Marquette University and an MBA from Loyola University.

STAHL is a division of The Scott Fetzer Company, a wholly owned subsidiary of Berkshire Hathaway Inc.

Almstead Expanding into Connecticut

Almstead Tree and Shrub Care Co. of New Rochelle, N.Y., recently purchased The Shade Tree Company of Westport, Conn. The Shade Tree Company, an NAA member since 1995, will now operate under the name, Shade Trees, A Division of Almstead. Roger Knoop, who had been serving as president/owner of Shade Trees for the past 14 years, will now hold the position of branch manager of Almstead’s Stamford, Conn., office.

Current clients include golf courses, property management companies, corporate and educational campuses, landscape and general contractors, municipalities, government agencies and residential accounts.

Schädlich wins World Logging Championships

Gottfried Schädlich of Germany won the senior division of the 25th World Logging Championships held in Scotland in September.

Competitors from all over the world gathered for three days in Birkshaw, Lockerbie, for the championships. The competition was organized in conjunction with the 2002 APF International Forest Machinery Exhibition.

After a particularly even battle, Schädlich edged out Josef Bitschnau of Austria for his first championship title. The competition was very close, and was not decided until the final event: de-limbing.

A total of 27 countries participated in the event. Most competitors came from Europe, but the starting list also included people from the United States, South Africa and a number of other countries.

The 2004 World Logging Championships will be held in Valli di Lanzo, just north of Turin, in northwestern Italy.

The other winners were:

Davey Tree Expert Co. Buys National Shade

The Davey Tree Expert Company of Kent, Ohio, has acquired National Shade L.P. of Houston, Texas, which positions Davey as the largest tree moving company in North America. Davey currently moves trees as large as 10 inches in diameter from its Jacksonville, Fla., and Wooster, Ohio, locations.

The acquisition of National Shade’s operation will allow Davey to move trees exceeding 60 inches in diameter throughout the United States and Canada.

National Shade, which has facilities in Houston, Texas, and Fresno, Calif., will work with Davey’s 80-plus offices throughout North America to cross-market services to existing clients.

David Cox, current president of National Shade, will remain district manager.
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Rigging for Safe Crane Operation
From The TreeWorker files

The following article only deals with some safety standards and practices for preparing to use a crane. It includes some safety information for rigging and removing pieces with cranes. You need to be trained and have a thorough knowledge of all ANSI Z133.1 safety standards for crane and other arboricultural operations before planning work with a crane.

Also, before using a crane, perform a site and job evaluation. Be certain using a crane is the safest and most practical way to perform the work or gain access to the tree.

Inspect and maintain all wire ropes, gears, chain drives and other parts in accordance with the manufacturer’s instructions and guidelines.

The crane operator or a qualified crewmember must inspect all chokers, slings, and other means of attachment before use. As you prepare for the job, everyone involved should check and double-check their equipment.

The crane operator, the climber (or bucket operator) and all the other workers directly involved with the crane removal must meet prior to the work to review procedures to be followed.

By reviewing one another’s responsibilities and the techniques to be used, you minimize the chance of any surprises along the way, and the actual work should proceed smoothly. Be certain that the crane operator is familiar with the potential hazards and operational techniques encountered in tree work. He has to remain at the controls and attentive to what’s happening in the air while a load is suspended.

Do not use guesswork to figure the pick weight or the crane’s capacity. A boom angle indicator helps the operator calculate lifting capacity. The crane should be equipped with a weight scale so the crane operator can communicate what the lift capabilities are before the arborist makes the cut. Calculate the weight of every pick.

Keep a green log weight chart available (see ANSI Z133.1-2000, Annex E). Use it to estimate how much the piece to be cut will weigh. Then have the crane operator take an actual weight reading so that adjustments can be made accordingly.

Site preparation is instrumental in allowing the tree removal to be completed as safely and efficiently as possible. First, improve visibility and limit the chance of struck-by injuries by removing limbs that interfere with the crane’s movement or visibility. Moving a boom through branches could cause them to shear off or whip back when tension is released.

When attaching the tree section, use a technique that allows as little movement as possible when the piece is detached:

- Dynamic loading must be avoided - never attempt to attach a piece that is out of reach for the crane or above the hook height.
- One possible alternative is rigging the piece into the tree with a rigging line and then attaching it to the crane.
- A line can be hung in the tree for lowering smaller pieces or to transfer the load in the event of an emergency.
- Have the crane operator pre-tension the sling to the approximate weight of the load itself before the cut is made so that the sling or slings are set and shock loading will be minimized.
- Reposition the crane if necessary.

Depending on the type of cut and lift desired, have the crane operator either hold that tension for the duration of the cut, as in lifting vertical sections, or release a percentage before making the final cut, as in performing a snap cut.

The TreeWorker newsletter is written by arborists for field employees in arboriculture. 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. Consider providing the TreeWorker newsletter as an employee benefit. To order a subscription, call 1-800-733-2622 or go to www.natlarb.com → Publications → TreeWorker.
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There's a certain romance to it—a thrill associated with the danger and a kind of

"The fact that tree work is inherently dangerous is undeniable. The fact that too many tree workers have been killed in action needlessly is unacceptable.

To pass up this opportunity to make a significant contribution to The Tree Dynamics Fund is inexcusable. The Tree Dynamics Fund has been established to address specific issues related to climber safety with particular interest in the areas of hazardous tree recognition and methodology. To save a tree is our profession, to save a life is our obligation."

Donald F. Blair, arborist

"An arborist is much more than a human who can climb a tree at great speeds. Many other animals climb trees, and most of them at much greater speeds! Yet the fastest human climbers are honored, and some go on to make lots of money for endorsements. Yes, climbing is important to get to work, but a person who just climbs is no more an arborist than any other climbing animal.

Arboriculture is the cultivation of trees. Until an understanding of tree biology is made mandatory to be called an arborist, accidents will continue to be on the increase. More people will be maimed and killed. It is time to wake up!

Bob, our son, worked as a mixed-gas saturation diver in the Gulf of Mexico for several years. I asked Bob if he was frightened and if the work was dangerous. His reply was one that we should not forget. He said that so long as you understand all that you are doing, nothing is frightening or dangerous. The flipside of this screams out to be heard, when you do not understand what you are doing, everything is frightening and dangerous."

Dr. Alex L. Shigo

"Our company has suffered some very serious accidents over the years and I know we are not exceptional in this regard. I regularly hear of very unfortunate accidents within other companies with very comprehensive safety programs. Often these accidents are written off to "a lack of experience," "poor judgment," "climber error" or some equally subjective cause. Often this is because we don't know what actually happened in the tree or in the technique. This fund is intended to clear up some of this unknown as well as sharing this information within the profession of the climbing arborist. If we within the profession don't do this, no one else will. Our workers and the profession are too important to let this situation continue."

John Hendrickson
The Care of Trees

"Nothing is more near or dear to me than tree worker safety. Every year arborists get injured and even killed while trying to perform their job. Even with the increase in technology and awareness, the statistics keep rising. Many key variables involved with rigging, tree reactions and dynamics are yet unknown. Research that will address these issues must take place and the findings need to get to the forefront of the battlefield where they can have the greatest effect-saving lives!"

Mark Chisholm
ITCC Champion 1997, 2001
pride that comes with triumphing over a difficult task others dare not attempt.

Working in trees can be dangerous. We must do whatever we can to ensure the safety of our workforce. We need more research in the recognition and identification of potential hazards to tree workers. And we need more effective means to teach workers to identify these hazards and to develop ways for working on hazardous trees while minimizing risk.

The purpose of the Tree Dynamics and Arborists’ Techniques Fund is to support and direct research, development, and training on the techniques and equipment that arborists use in climbing, rigging, and working on trees; and the means of identifying potential hazards, to provide a safer working environment.

Each year, hundreds of workers are killed or seriously injured. The Tree Dynamics and Arborists’ Techniques Fund was established within the TREE Fund to address these problems.

As long as trees and people coexist in urban areas, the need exists for arborists to work in or remove trees, including trees with known and unrecognized hazards.

We need your help. The sole purpose of the Tree Dynamics and Arborists’ Techniques Fund is to find solutions to problems such as these and to get those solutions out to the workforce to start saving and protecting lives. But these efforts will require extensive financial backing. Pledge to help us find the answers to a better and safer future for arborists.

For more information or to make a donation, please contact: Tree Dynamics & Arborists’ Techniques Fund, P.O. Box 3188, Champaign, Illinois 61826-3188. Phone: (217) 239-7070. TCI

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35
Short-Term Capital

By Mary McVicker

Access to short-term borrowing or financing is critical to most small businesses. There comes a time when the timing of the cash flow simply doesn’t match the deadlines for paying bills. In many small businesses, short-term borrowing in some form comprises between 6 percent and 10 percent of the business’ capital structure.

This percentage can vary widely between similar businesses. The “averages” given in pro forma financial profiles can be both worrisome and misleading to someone whose business carries short-term debt above the given average. The key, obviously, is the business’ ability to carry that amount of debt:

- Can the payments be made without straining the cash flow?
- Does money for the payments come out of money designated for something else, or is it discretionary?
- How dependent is the business on debt?
- Will the debt be retired within a reasonably short period of time?

In the past, many bankers were more willing to make short-term loans instead of long-term loans to small businesses, even when a long-term loan would have been more appropriate. In part, this was simply a matter of the times and the trends, but there were other reasons. If a business is heavily dependent on one person, as many tree businesses are, a long-term loan is considered riskier in the event something happens to that key person. The failure rate of small businesses was evidently very much on bankers’ minds as well – sometimes to the point where the track record of the business was barely acknowledged, let alone considered. Also, since long-term loans obviously extend over a long period of time, there is more opportunity for things to go wrong in the business, and consequently with the repayment.

Fortunately, the economic significance of small business has finally gotten some of the recognition it merits. Banks woke up to the fact that small business have enormous potential for their industry. Today, of course, the perceived greater stability of very large corporations has eroded. To a smart banker, all customers are important and potentially profitable. Size is no guarantee.

The Mismatch Mess

Using long-term credit for short-term needs is a misuse of resources, but it’s less problematic than the reverse and often works, after a fashion. The reverse — using short-term debt for long-term needs — is loaded with potential problems, the obvious one being that the time for repayment arrives too quickly. For instance, if the need is for a major piece of equipment, the short-term debt is going to have to be renewed several times over the life of the loan. What looks like a shoo-in for renewal now may look seriously different a year from now.

On a more philosophical — but still practical — level, the ability to borrow gives a business flexibility. That flexibility is enhanced by the ability to get short-term financing or loans. This flexibility is a secondary asset of the business. It doesn’t show up on the balance sheet, except indirectly, but it’s a significant resource. Borrowing immoderately misuses that resource.

The matching principle: short-term borrowing for short-term needs; long-term borrowing for long-term needs. It’s an old rule of thumb, but one that still holds. It’s easier to ignore in the boom times; ignore it at your peril when the economy is tight.
Advantages and disadvantages of short-term debt

As we examine these pros and cons, keep in mind the point of view of the bank, or lender, as well as the advantages and disadvantages to your business. That lender's mindset is important when you're applying for a loan.

- **Cost**
  Cost is the most obvious factor. It's also the most complicated. Most small businesses have few options for negotiating terms, particularly with short-term loans. Additionally, there rarely seems to be a simple "true cost" of a loan. The complicating factor is the time frame. Because repayment takes place over a period of time, or is made in a lump sum at the end of a period of time, the question arises about determining the value today of an amount to be paid in the future.

  For instance, if Business X borrows $8,000 to be repaid a year from now, what's that worth to the lender? First of all, he has to wait for the money. There are inflation considerations. Risk considerations are a factor as well. Economic considerations play a part. In today's tough economy, $8,000 is harder to come by for many people than it was two years ago, and consequently seems worth more than it did. On the other hand, $8,000 doesn't buy as much as it did two years ago. How does all that change the "value" of getting $8,000 in one year?

  Economists are concerned with such matters. For most of the rest of us, it's sufficient to know that these concerns make it extremely difficult, if not impossible, to get at a simple cost of money. We take the cost that's quoted to us -- just as we accept a price quote on a piece of machinery without inquiring into the cost analysis that went into figuring out how to price the used chipper.

- **Reduction of flexibility.**
  A business has limited potential for borrowing, regardless of what some of the ads say. Once that potential is reduced, the leverage ability of the business is lessened, possibly making it more vulnerable to problems caused by a slowdown, breakdown of an essential piece of equipment, or other unexpected difficulties.

  Furthermore, once a business enters into a loan, certain amount of cash flow is designated, officially or otherwise, for repayment, leaving the business with less disposable cash, and less ability to meet the unexpected. There are also disadvantages of going through a borrowing procedure, which includes having to disclose confidential information and, in some situations, the need for compensating balances or the insistence on the lender having some managerial say-so.

  Some borrowers perceive the need for compiling a borrowing package as an additional disadvantage. This depends on the lender's requirements for such a
package. In many cases the information is readily available – or should be if you are managing your books properly. The process of compiling the history and the projects – particularly the projections – can be useful, and arguably, should be done in any event, regardless of whether or not you are applying for a loan.

Sources of short-term capital

One of the most common sources of short-term capital is a line of credit. By no means are these all alike; terms can vary surprisingly. A line of credit must be applied for – it is a loan, after all, although banks often talk around that fact. But once obtained, the line should offer significant flexibility to a business. Before lines of credit became widely available, small businesses frequently found it difficult and often expensive to borrow relatively small amounts of money.

Bank loans are useful for fixed borrowing; these, of course, have fixed repayment terms that begin immediately. Banks increasingly offer a range of credit and borrowing options. One of the advantages of borrowing from a bank is the availability of professionals whose job it is to help borrowers sort through the various options. (It’s not uncommon for a bank to have types of loans you’ve never heard of.)

Rather than fix on a particular loan at the onset, it might be useful to seek advice: “This is the type of cash need the business is facing. What type of loan or borrowing would be best in this situation?” Having some basic financial information about your business will help the banker make more informed recommendations. Of course, banks aren’t the only financial institutions that make short-term loans.

In any borrowing situation, keep in mind that the lender is in business and that you’re a potential customer. If you don’t get satisfactory answers, if you think the banker regards your business as too small to bother with, or if the person isn’t professional enough to show some interest in your business and your situation, go elsewhere.

Short-term borrowing – short-term capital – can be immensely useful for financing short-term needs. Many businesses with seasonal fluctuations (such as tree care companies) rely on short-term borrowing to get them through the year.

The value of having access to short-term capital is highly underrated, and in fact is often overlooked. As is the case with any asset, the more prudently you use it, the better it serves the business.

Mary McVicker was a tax attorney before leaving to teach and write. She has been a small-business consultant in Brookfield, Ill., for more than 18 years.
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One truck maker has developed a finished version of some thing many arborists have set themselves up for over the years: It has turned a pickup truck into a mobile office.

The manufacturer, GMC, has introduced the 2003 model Sierra Professional. The truck is equipped with some of the most advanced current office and truck operating devices. Many are electronic.

Features of the pickup include a compartment for file storage, a clipboard pocket, a removable, 12-volt, hot/cold “lunch box” container, hot/cold cup holders, and 12-volt access points.

Under the rear seat, a fitted storage area houses numerous storage compartments.

Sierra Professionals are sold with two- and four-wheel drive, an extended cab and short-box configurations. Options include gasoline and diesel engines, and manual and automatic transmissions.

The computer system studied in preparing this report was a Panasonic “Permanent Display Removable Computer” (PDRC), which is based on the Toughbook CF34 laptop computer. In short, this setup moves most of the bulk and weight associated with a ruggedized mobile computer and mounts it remotely in the rear cab area, clearing the way for required airbags in the front of the truck.

The laptop computer can be removed when necessary to take it into a job site trailer or a corporate office. A compact but fully functional, foldaway keyboard and screen are securely mounted near the driver’s seat and connected to the heart of the computer through a harness and “docking” system.

Extending out of the truck, the old-fashioned aluminum clipboard has been replaced by a digital device: Not a fragile pocket-sized piece of plastic and silicon with too little power to perform more than a few simple tasks, but rather an easy-to-read device that brings desktop PC power and applications into a wirelessly connected digital clipboard: the Panasonic Mobile Data Wireless Display (MDWD).

The MDWD employs the widely-used Wi-Fi (IEEE 802.11b) wireless LAN (local area network) technology to link back to its host, which can be any PC device equipped with a compatible wireless LAN card. Proprietary software is used to perform instantaneous updates between the PC and the MDWD.

With up to 300 feet of range, the operator can collect a contract signature on the MDWD’s 8.4-inch touch-screen and have it immediately stored on the PC located in the truck’s cab. If the on-board PC is equipped with a wireless WAN or satellite link, the combined system provides a nearly real-time connection between the driver’s “digital clipboard” and the operator’s headquarters.

Taken together, the pickup and computer just might let arborists give up their office lease entirely!
In the real world, one requirement that never changes is finding ways to help your crews work more safely. That's why Altec tree care equipment is built rugged, reliable and designed with integral safety features. Our complete line of aerial devices and wood chippers is highlighted by our newest machine – the Altec LRV60. It will help your crews work smarter and more efficiently. This unit combines 65 feet of working height and smooth maneuverability with the lowest cost of equipment ownership in the industry and unmatched financing options. For tree care units that help you work safer and smarter, call the company that builds them – Altec.
Is that Climber an Employee or Independent Contractor?

Beware costly tax penalties when using independent contractors

By Phillip M. Perry

While the use of independent contractors is a popular way for small tree care business owners to control expenses, employers need to be aware of the downside: Back taxes and costly penalties can result when the IRS reclassifies self-employed workers as employees.

“This topic causes the most panic in the human resources area,” says Dr. Edward H. Hernandez, associate professor of management at California State University Stanislaus, Stockton, Calif. “Many business operators are not knowledgeable about the law.”

The risk of running into a problem is high, because the IRS has not provided a clear-cut definition of what constitutes an independent contractor. “Businesses are often shocked to learn that people who perform services for them are their employees in the eyes of the IRS and state departments of unemployment insurance, unless business owners can prove that these people are under contract,” says Nancy E. Joerg, an employment attorney with the law firm of Wessels & Pautsch, St. Charles, Ill.

Employers find themselves under fire from several fronts. One audit by the federal or state government usually triggers action by the other. And the wage and price division of the U.S. Department of Labor also gets involved, often determining that an employer failed to pay overtime for those reclassified individuals who worked more than 40 hours a week. That means still more retroactive taxes and fines.

Major problems often arise when a departed worker blows the whistle on questionable practices. “People who report wrong classifications can get up to 33 percent of what is recovered,” notes Hernandez. “Because of the big financial incentive, almost invariably someone will whistle blow.”

The attractions of independent contractors are obvious. They can be used on a regular basis for tasks that require skills not already found inside the business, or for temporary periods to ease heavy workloads or accomplish specific projects without bloating the payroll. They often perform duties such as sales, keeping books, delivering materials, cleaning up the office, and a host of other activities.

No wonder employers are seeking self-employed people
more often. “The use of independent contractors is increasing very rapidly,” relates Joerg. “It’s very costly to have a regular employee workforce which is a fixed item of overhead. It’s more financially advantageous to add to and subtract from an organization’s workforce as the need changes. It’s much easier to do that than to fire and hire all the time.”

“The IRS is making this a top priority for litigation purposes,” warns Allen L. Schwait, a Baltimore attorney who has defended businesses in such cases. “So people need to learn the law.” The time to act is now. For each of your independent contractors, answer the 20 questions below. Attorneys have culled these questions from court cases and IRS decisions over the past few years. The more “yes” answers to these questions, the more likely the IRS will decide your outside contractors are really employees.

Caution: These questions are only general guides. There is no cut-and-dried method to determine independent contractor status. Consult your attorney for detailed advice about your outside contractors.

1. Must the worker follow your instructions as to how work is to be performed?

This question is listed first because in some ways it is the most important. It cuts to a fundamental element of IRS reasoning that appears in many of the other questions that follow: the more control you have over the activity of your worker, the more likely it is that you have a full-time employee on your hands.

Do you tell the person when to come and go? Or do you direct the way the person does the work on a regular basis? If so, the person may be deemed to be an employee.

This guideline can apply if you only have the right to make such directives, even if you do not actually do so.

Compare this to a situation in which you simply say to the worker: Give me a price and do the job. That person is more likely an independent contractor.

2. Do you train the individual?

If you train the individual to perform job duties, this can indicate you have control over the person. Once again, the presence of control implies an employment situation in the eyes of the IRS. Such training can take the form of counseling, requiring the individual to attend meetings, or having the person work with a co-worker who explains job duties.

3. Are the worker’s services critical to the continuation of your business?

If the progression of your business depends on the results of the worker’s labors, it follows that your business will be more likely to attempt to control such labors. The IRS says this implies the person is an employee.

4. Do you require that the individual perform the work personally?

If you insist that the worker perform the labor personally, the IRS believes this implies a measure of control over how the work is performed and that the worker is an employee. A true independent contractor, goes the reasoning, could assign the work to someone else.

5. Do you hire assistants for the individual?

Your role in hiring assistants for your worker implies control over such assistants and an employment status for the individual. In contrast, an independent contractor would be likely to hire and fire assistants without your intervention.

6. Do you have a continuing relationship with the individual?

Even if work is performed at irregular intervals, the fact that you use the individual’s services over a long period of time is one factor that tends to indicate an employment status.

7. Do you dictate what hours the individual works?

Suppose you insist that the individual show up for work at a certain time. Or suppose you state that the person must work a set number of hours each day. This implies control over an employee.

8. Do you require that the individual spend all of the working day on your projects?

If you insist that the individual devote
full time to your projects, the IRS has
demed this a form of control over the in-
dividual. This situation keeps the worker
from doing other gainful work. In contrast,
an independent contractor would be free
to work for other businesses.

9. Does the individual work
on your premises?
If the worker performs duties on your
premises, this can imply you exert some
control over the individual. The IRS puts
particular emphasis on this factor if the
work is of such a nature that it could be
done just as well at another location. "I
often suggest that an employer include a
rental provision in the contract and have
the independent contractor pay rent,"
says Joerg, adding that such a provision
has proven itself helpful in some of her
court victories at both state and federal
level. "It's one way to turn a negative
into a positive: What employee, after all,
pays for the space used when working?"

10. Do you dictate that work be
done in a certain sequence?
Suppose you order that specific steps
required for a project be done in a certain
order. The IRS has determined that this
implies a measure of control over the
worker and suggests an employment situa-
tion.

11. Do you require reports of steps
taken or work accomplished?
If you tell the worker that oral or writ-
ten reports must be submitted, the IRS
says this suggests a degree of control.

12. Do you pay by the hour, week
or month?
Periodic payments can indicate an em-
ployment situation to the IRS. The
exception is if such payments are simply
installments in a lump sum agreement for
a project fee, a typical arrangement in an
independent contractor rela-
tionship. In contrast,
periods by project, or
commission payments,
generally lean toward in-
dept contractor status.

13. Do you pay the
individual's business or travel
expenses?
Reimbursement of a worker for busi-
ness and travel expenses may imply a
degree of control over that individual's
activities. The IRS feels the party who
ultimately pays the expenses will have
some say over a ceiling of expenses for
each category of expense, and thus over
the activities of the worker.

14. Do you furnish the worker's
tools?
If the worker uses your tools and ma-
terials on the job, this implies an
employer-employee relationship. A true
independent contractor would possess a
set of tools for performing similar tasks
for other businesses.

Ways to Protect Yourself
- Give the headache to someone else: Hire your self-
employed staff, and part-time workers, through a third
party payroll service that employs those individuals and
takes care of tax withholding and reporting.
- Let 'em do it their way: Don't provide instructions,
tools, office space, or reimburse expenses for individu-
als whom you have classified as self-employed workers.
- Avoid the "employee shuffle:" Don't hire back
former employees on a contract basis as consultants
or other type of independent contractor. Treat such in-
dividuals as employees.

15. Does the worker depend on
your investment in workplace
areas to get the job done?
If the worker uses facilities which you
have developed to perform duties, this
implies an employer-employee rela-
tionship. In contrast, if the worker has invested
significant money in an office, this implies
independent contractor status.

16. Does the worker have no risk
of loss from the results of the ser-
dices rendered?
If your worker does not incur the risk
of loss normally associated with running
an independent business, this implies an
employment relationship. An indepen-
dent contractor, on the other hand, can
realize a profit or loss from business in
which that individual is engaged.

Collect This Paperwork
Be smart: Start collecting proof that your independent contractors are just that.
"The key thing to realize is that the company and not the IRS has the burden of
proof with regard to independent contractor status," cautions Nancy E. Joerg,
an employment attorney with the law firm of Wessels & Pautsch, St. Charles, Ill.

Ask each of your independent contractors for documents that prove self-emp-
ployment status. Here are some such documents that Joerg says often impress
IRS agents:
- Business cards with a business name on them. For example: "Tom Brown
  Delivery Services," not just "Tom Brown."
- A federal employer ID number (not just a Social Security number) for pur-
  poses of issuing 1099's.
- An invoice for each separate job.
- 1099's from other client companies, proving the individual has other cus-
tomers.

Avoid written contracts stating that the individual is an independent contrac-
tor, unless such contracts have been reviewed by your attorney. "These
contracts are often disasters, because the terminology is wrong," says Joerg.
17. Does the individual work only for your business?
A worker who is engaged only by your business may well be an employee. In contrast, a worker who performs duties for many clients is more likely an independent contractor.

18. Does the individual fail to offer services to the general public?
A worker who does not promote services to the general public may be deemed an employee of your business. In contrast, an independent contractor would pursue the prospecting normally associated with an autonomous business.

19. Do you have the right to fire an individual?
If you hold the threat of dismissal over a worker if instructions are not followed, the IRS may decide you are an employer. Compare this to the situation with an independent contractor, who cannot be dismissed as long as the work accomplished meets the specifications outlined in a contract.

20. May the worker quit at any time without incurring a loss?
The individual who may cease working for you and not assume a liability for doing so is often seen to be an employee. On the other hand, an independent contractor who quits on you would incur liability for breaking a contract, and possibly be subject to a lawsuit.

Putting it all together
Remember that no formula exists for establishing an employment relationship. In some cases, a single “yes” answer can indicate that an individual is an employee of your tree care company. In other cases, some of the questions may be answered “yes” without incurring a determination of employment. Most often, the IRS weighs all of the questions in combination prior to coming to a determination.

Go over the above questions with your attorney to determine the status of your workers. “For the employer using independent contractors,” says Hernandez, “there are many traps and ways to go wrong.”
A Reasonable Value

By Lew Bloch

The Council of Tree and Landscape Appraisers (CTLA), authors of The Guide for Plant Appraisal, is resuming its former regular feature known as "Council Corner." Some of you may remember that most of the CTLA member associations' regular publications printed this column in order to help educate and inform the green industry on the plant and landscape appraisal processes. The CTLA is now composed of seven associations, which are: Association of Consulting Foresters; Associated Landscape Contractors of America; American Nursery and Landscape Association; American Society of Consulting Arborists; American Society of Landscape Architects; International Society of Arboriculture; National Arborist Association.

CTLA strongly recommends that any person involved in appraising trees and landscaping read the entire Guide for Plant Appraisal. Make certain you are using the 9th edition published in 2000. There is so much information and guidance in the book that just reading certain chapters to glean information on a certain subject may not be enough to select the proper methods and to perform an accurate and plausible appraisal.

For instance, appraisals are written for native, woodland plants using trunk formula and replacement cost methods. This is resulting in extraordinarily high appraisals for trees that may have very little contributory or amenity value.

We have seen some very high values on some native woodland trees on residential properties that are so far removed from the house that the property owners cannot even see them. Also there have been similar situations of appraisals on large tracts of land with unrealistic appraisals of value on wild native trees with little or no intrinsic or landscape value. It is not the appraiser's assignment, and is unethical, to attempt to make an appraisal high to satisfy a plaintiff client or to make it unrealistically low to pacify a defendant client. We need to be advocates of the truth!

The Guide has numerous references, in several places, to appraising trees that may not have contributory landscape value. This is an example where one would need to read the entire book. These references cite such examples as needing to estimate the contributory value from an asset standpoint; making a decision between landscape value and timber potential; realizing that these may be so far away from the home that forest product values may be more reasonable; and that the income approach (timber or cordwood) may be more appropriate than the cost approach.

Further, the professional appraiser should perform some sort of reasonableness testing as suggested in The Guide. This chapter states that the appraiser should consider the market value of the entire property, and that the contributory value of the plants to that property be considered. If an undeveloped property was recently purchased for $15,000 per acre, it is unreasonable to place a value of $250,000 for damaged trees on an acre of it.

So, read the book, analyze the situation, apply the proper method(s), and perform a reasonableness test. The process need not be complicated, and the final appraisal will be a professional one.

Lew Bloch is a registered consulting arborist and the Associated Landscape Contractors of America delegate to CTLA.

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This web-based course familiarizes you with information needed to offer a reasonable opinion on the value of plants. The six-lesson workshop is based on, but not limited to, the material presented in the CTLA Guide for Plant Appraisal. Completing the Plant Appraisal Workshop provides essential knowledge that will help you with plant appraisal, regardless of your experience level. For more information, go to www.Arborlearn.org.

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A Systems Approach to Managing Snow Removal Operations

By John Allin

Running a large snow operation during a storm can prove daunting to anyone who cannot envision how it is to be done. If you are utilizing more than 15 units to service your customers, you need to have a system in place to make it all happen smoothly and efficiently. Across the country there are a good number of contractors in the business of snow and ice management who have a viable system to allow for an orderly transition from one account to another. This ensures that all customers are serviced properly and in a timely fashion. Additionally, if the system is run properly, all subs and employees will have their hours recorded properly and will be paid on time and in full.

One person can adequately “get their arms around” about 15 units plowing and salting customer locations with very few notes. Once you begin to manage more than this number, records need to be kept so that you don’t overpay or underpay your employees (or subs). Records also need to be kept as to who got plowed and when, so that your invoicing can be accurate and above reproach. You need to operate like a business entity.

Once the decision is made to begin plowing operations, you need to get the word out to those who are working with and for you. A reverse pyramid system usually works best. This is where you make the decision to start plowing and then place calls to the supervisors of a particular area. They, in turn, call out the crew leaders or crew members and tell them that “it’s time.” Area supervisors should be keeping track of when crew members were called out and when they started working – if you are paying them by the hour. The same holds true when the snow (or ice) event comes to an end and plowing operations are terminated. Keeping track of end times becomes the responsibility of the supervisors or crew leaders. Have crew members call into your office to turn in their hours as a doublecheck of what the supervisors are turning in. This will help eliminate discrepancies when it comes time to pay employees or subcontractors.

At some point as your operation grows, it will be necessary to justify having someone out there who will not be responsible for generating revenue. These will probably be the area supervisors (referred to above) who are usually responsible for overseeing what goes on with assigned routes.
These individuals are non-income-generating expense that needs to be covered as overhead. They will “put out fires” and cover for those that don’t show up for a particular snow event. Additionally, these individuals will be responsible for customer satisfaction. Most companies will pay these individuals more money for the additional responsibility.

Having a strong dispatcher is the key to making this whole scenario work. The dispatcher is in constant communication with area supervisors and handles all the paperwork at some point. Area supervisors turn in their paperwork to the dispatcher. These include time sheets and completed route sheets for those who are plowing for them, and for those accounts assigned to them. What the dispatcher says, goes. A dispatcher, doing his job properly, will know what routes are not going to be completed on time, what routes are always trouble, and what plowers have not shown up this time out.

The dispatcher keeps duplicate time sheets and route sheets at his fingertips. Two or three times during the event, the dispatcher checks with the area supervisors to find out what has and has not been plowed yet. He marks the “completed accounts” on the sheet that lists them (or checks them off as having been completed). In this fashion, the dispatcher has, at his fingertips, an accurate accounting of “where we are at” during the event. Knowing that the area supervisor is very busy in the field, this is a great “check and balance” to ensure that all accounts are serviced and not forgotten. Good communications flow between the dispatcher and the area supervisor is necessary for this to happen smoothly. The area supervisor must answer the questions that the dispatcher poses about “who’s done, and who’s not done.”

The area supervisor should be able to communicate with all of the crew leaders or crew members assigned to him. It isn’t really cost efficient to supply all plowers with dedicated-channel, two-way radios, but citizens band (CB) radios are usually inexpensive. Their range is limited, however, they are sufficient for communications between plowers on a particular site – or plowers to their crew leaders/area supervisors during a snow event. In this fashion, the area supervisor can move plow units from site to site if necessary and keep himself updated as to the progress of a crew.

In some operations, the dispatcher has access to a base station CB (with antenna mounted on a tower perhaps). This is great for listening in on what is happening with a particular route’s crew. It is advisable to have the dispatcher communicate with the area supervisor via CB, since the channel can be listened to by almost anyone, including competitors.

Another form of communicating is the new Nextel system that is quickly gaining acceptance across the United States. This combined phone and two-way ra-
dio usually has a much wider range than any standard two-way trunk radio system. Often the two-way instant communication range of the Nextel System is measured in hundreds of miles. For example, a Nextel user in Erie, Penn., can have instant, two-way communications with another Erie-based Nextel user when they are in Sandusky, Ohio (a 3.5 hour drive away). Of course, that convenience comes with a price - and that price is substantially higher than the cost of CB communications or trunked two-way radio systems.

On a side note, some might argue that having such easy and accessible communications with subcontractors might be cause for concern as far as IRS and state rules governing independent contractors. It is just plain unsafe, however, to have five, seven or 15 plowing units on a site, working among each other in a snowfall where three or four inches per hour are falling. Some semblance of organization must be maintained in order to keep the plowing units from running into each other. Therefore, there is precedent that this is one of the lesser weighted "tests" in determining if these independents should be classified as employees.

Other key personnel in this storm management system are the support staff, which may be just one person. In fact, for companies just starting out, the dispatcher may serve as the support staff, too. If you should decide that you don't yet need or require separate employees to do these tasks, so be it. However, for purposes of this article, let's diagram out the support staff by separating their duties.

**Support staff**

As noted above, the area supervisor will begin the initial paperwork flow. This person obtains pertinent field information - start and end times for plow personnel (employees and subs), what was plowed, when (if needed), and site conditions in the general geographic area...
of responsibility. Once the snow event is over, the area supervisor turns in this paperwork to the dispatcher, who checks to make sure that all lines are filled in and all required data is there. This should be done immediately after the paperwork is turned in, and should be done with the area supervisor present. If this is not possible, then the document should be faxed to the dispatch office for processing.

From these field documents comes a plethora of information. The use of a simple Excel spreadsheet program will greatly assist in data input. An administrative person (and as noted, in a smaller operation these positions may be filled by one person) can enter the start and end times for each “unit” moving snow – be they employee or subcontractor. The Excel document can be set up to automatically calculate the time spent plowing. This same document can be set up with the hourly rate that the employee (or sub) is being paid, and made to figure out automatically how much money has been spent on this person’s time. The document can also be configured to add up all the subs’ times by area so that you have an accurate accounting of what you have spent on that area’s plowing for a particular “event” or time period. Again, this document can then add up the expenditures for each area (if there is more than one), and you can quickly have an accurate accounting of what the company has spent.

If the hours are put into the Excel document as they arrive in your office, it is entirely possible to have your “expenses” within minutes of having all the information in your office. What a great tool for knowing your costs!

Additionally, if most of your plowing is done “per push” rather than per season, you can easily find out how much revenue you have generated during that event. Go back to the dispatcher and the fact that the area supervisor has given an
accounting of what was plowed during his or her shift. An administrative assistant can take this information directly from the dispatcher’s route sheet documents or from the area supervisor’s route sheet documents. A simple billing program can be altered to have the pertinent language already there as a “macro,” so that generating an invoice in the computer is an easy task. If all accounts have been plowed, this makes invoicing all that much easier. In this fashion – and assuming that someone actually takes the time to do the billing – it is possible to know within a very short time period how much revenue you have generated.

From there it is a simple task to subtract expenses from revenues to determine gross profit for the snow event. The same holds true for applications of salt, although if you are charging “per pound” or “per ton,” you may have to wait for the salt truck operator to return with the quantities used in order to invoice accurately.
The dispatcher also has an important role when it comes to customers. During a snow event, if anything is amiss on a site, it should be immediately reported to the dispatcher. A good dispatcher will then advise the (commercial) customer immediately of what the problem might be. Most businesses now have either fax machines or e-mail. By informing the customer during the event, and right after being advised of the problem, you gain credibility with the customer. You cannot communicate too often to the customer.

For example: Your subcontractor arrives on the site only to find that the automatic gate’s wood arm is damaged. The sub contacts dispatch and informs them of the damage prior to beginning plowing operations. Good subs (and properly trained employees) will do this so that they are not blamed for causing the damage. The dispatcher then faxes notification that the arm was damaged prior to our arrival to the commercial customer’s point of contact. In this way the customer has a “time stamped” document attesting to the fact that his honest contractor dutifully notified him of a problem on the site. This lends credibility to what you are doing and avoids the potentially embarrassing situation where you are left answering questions that are raised the next day. You don’t want a call from the client when your bill arrives to the effect of “Hey, what about that damaged lift gate that your guy ran through during the last snowstorm?” At that point, you are operating from a position of weakness.

When dealing with how you should schedule all these units moving snow, there are arguments for and against how long the schedule should take to complete. In some markets, the schedules are set up so that the plowing is completed within 12 hours of starting. Most contractors around the country work on a six- to eight-hour schedule in a normal snowfall. Keep in mind that “normal” accumulations also vary widely from one region of the country to another. When an extraordinary event takes place, the timetables are extended depending just how far above normal the snow event is.

Knowing how to react in the event of a snowfall, having a plan that can be referred to in such cases and the comfort level knowing that some discussion has taken place in order to achieve the highest level of service for your customers is essential to success. As with most successful businesses, communication is the key to that success.

John Allin is president of Allin Companies in Erie, Penn. He is Board President of the Snow & Ice Management Association. This article was reprinted with permission of the publisher. “Managing Snow & Ice: A Practical Guide to Operating a Profitable Snow and Ice Removal Business,” GIE Media Inc. To order a copy of the book or CD of sample business forms, call 1-800-733-2622 or order online at the NAA bookstore, www.natlarb.com.

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TREE CARE INDUSTRY - NOVEMBER 2002
Long-Lived Tree Spades ...

The Vermeer TS20 mini-spade is narrow for maneuvering in tight rows, yet is built heavier to push spades easily into the ground.

... Contribute to Long-Lived Trees

By Rick Howland

It's been only a generation – maybe 30 years or so – that the tree spade has been around. In that time, it has all but put an end to the old-fashioned hand or back-hoe dug procedure. However, as a “technology” (if we want to go that far in its description), the advent of the tree spade has made contributions not only to arborists who own them but also to the trees they transplant.

The spade initially was intended to make it easier to dig up, move or transplant larger specimen-size trees, commonly those larger than the balled and burlapped varieties found at the nursery. The objective was to find an easier (and therefore more profitable) method of taking and transplanting trees for “instant” shade or beauty.

Along the way, a second benefit became obvious: Higher survivability rates. How's that possible over the old hand-dug method? Two reasons. First, the compound form and angle of the spade – somewhat like a spoon – makes for a more compact root ball. Second, the precise cutting nature of the mechanism and the fact that the spade can carry the tree with minimal disturbance means the precious roots and root hairs remain contacted with the nutrient- and moisture-rich soil.
When Tree Care Industry magazine interviewed makers of tree spades, those two criteria — simplicity and survivability — kept coming up as the main motivations for the tree spade and its continuing evolution in terms of both design and root ball capacity.

Differences in tree spades are varied. Tree spades can be mounted on trucks, trailers or skidders — even farm tractors — meaning they can be used in tight nursery and residential areas or wide-open forest areas; for digging and hauling locally or over long distances. Some are designed for use on one machine in tight spaces and are re-mountable for transport over distances or difficult terrain.

Prices range from $8,000 to $80,000 or more for some built-to-order units. Whether the tree spade is on the small side (for nursery or light landscape use) or the behemoth 100-inch that requires attention to DOT regulations to make them not only efficient but also legal for over-the-road portage, the objectives are the same: profitability and survivability.

A tool for profitability

- **Long ROI — return on investment.** Spades last a long time, assuming normal maintenance. They are simple in terms of moving mechanical components, driven by a proven hydraulic system. Not “destructive” by nature like a grinder or chipper, the calmer life and environment of a tree spade contributes to its longevity.

- **Low maintenance costs.** Large or small, with proper care, a spade will last 10, 15, 20 years or more moving from one owner to the next with the same level of productivity. Simple valving connected to existing truck tractor or skidder hydraulics operates the dig, lift and tilt requirements from one operator station. Grease points need regular attention as do dedicated remote engines that run the hydraulics on portable trailer units. Spades themselves need little attention — other than blade point alignment adjustments and occasional sharpening. With the exception of a broken blade, the

spades last the lifetime of the unit. (Most units are powered by a hydraulic lift cylinder. Some employ a chain drive that requires normal chain lubrication and maintenance.)

- **Tree transplanting can be lucrative.** With a 50 percent margin common (100 percent markup on the cost of the tree if purchased, and more if the arborist has a private source), single, large-specimen trees can contribute $1,000 or more each to the bottom line. Given that the procedure often requires only one piece of equipment and one operator, profitability levels can be much higher than on other jobs.

Chris Nichols, product manager for the environmental division at Vermeer (one of the pioneers of the industry and holder of some of the original patents), says the tree transplant industry has changed in the past 10 to 15 years. The most recent trend has been toward units with bag and burlapping capabilities, augmenting a legacy in the midto larger-size spades, many of which remain in use in second and third ownership.

Nichols says a basically sound economy is good for the transplanting business, and efforts in the United States and Europe to control soil erosion and to make contractors and landscapers responsible to restore disturbed work sites make for a healthy demand for transplants, and, thus, for the tree spade.

Vermeer makes spade units ranging in ball capacity of from 20 to 52 inches. The TS 20 and 30 (with 20- and 30-inch capacities, respectively) are three-point mounts. The TS300, a 33-inch, can be either three-point or skid-steer mounted. The TS30m, accommodating 48 to 52 inches, is a truck mount design capable of 1,900 pounds.

“We’re focusing on units like the TS44 models (TS44A trailer or TS44T truck),” explains Nichols. “These are popular, user-friendly smaller machines.
capable of transplanting up to 4-inch caliper, fairly mature trees with a ball diameter of 44 inches, ball depth of 40 inches, and they can manage a tree ball weight of 1,173 pounds.”

In recent months, Vermeer has found renewed interest in its larger diameter units, such as the TS 8000 and TS66. “These accommodate larger diameter and taller, much more mature trees – some up to 20 feet tall.” Nichols says. The demand, he adds, is for trees with leaves that can be moved right in. “We are seeing a lot more activity in this area where people don’t want to put in a seedling and wait for it to grow.”

A tool for survivability

Wayne Van Mersbergen is a trainer for Vermeer. A former product specialist and still owner of a tree care company, Fran-Way Tree Moving Inc. in Pella Iowa, he’s familiar with both ends of the industry. “I’ve been transplanting trees since 1965. In those days, it was pretty much all by hand, even up to 5-inch diameter trees,” he says. It’s nicer, easier and more profitable to push a few levers.

Having experienced the transplant revolution, Van Mersbergen is convinced that tree spades make for trees that are better off.

“Hand spading or back hoes often don’t make cuts cleanly. Vibration from digging further damages roots,” he adds, noting that the problem is compounded by the agitation required to wrap burlap, get the ball out of hole, move and drop it onto a truck or trailer where it can further deform, knock off precious soil or create open air pockets. With the old method, this can happen three times or more, he explains.

“Tree spades traumatize the tree once,” Van Mersbergen relates. “With the blades down, the ball stays intact during transport and makes liveability better.”

He also notes that some of the smaller units with single-process capability can dig, ball or wire-basket into a tight package that can be picked up and moved more easily with less impact on a tree.

From an entrepreneurial standpoint, Van Mersbergen says transplanting has been “pretty steady as a business all along, especially in the 8-inch and smaller trees.” While they can grow up to 30 feet in a crowded timber environment and only 20 feet in a less competitive nursery environment, “I’m mostly concerned with the diameter of the trunk which, together with the root ball, dictates the tree spade requirement.”

Looking back on economic effects over nearly 40 years, he concludes: “The economy affects what people transplant and the size of tree spades sold. A tree is a luxury. In a bad economy, they won’t pay $400 to 500 to transplant a larger tree. They will plant a smaller one and wait for it to grow.”

As a trainer, Van Mersbergen takes less than a day to teach basic operation, and after that, it’s a matter of experience on setting the tree properly.

One of the most prolific brands in the industry is Big John, which is noted for its five truck-mounted tree transplanters capable of moving up to 12-inch caliper trees with balls in excess of five tons. Key features of Big John units are not only the capacity but also the single-operator sta-
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tion and near horizontal transport position even on rough terrain. Typical root ball configurations for its spoon-shape spades are 34, 42, 52, 62, 80 and 90 inches.

Will Humphreys, a vice president at Big John’s, says that growing demand and interest in transplanting established specimens means the transplanting business is still in its infancy.

“Initially, the arborist didn’t think much about mechanical tree spades, but survivability rates have helped gain their acceptance,” Humphreys says.

“Big John’s spoon-shaped blade helps with getting more of the root system and a more containerized root ball,” he adds.

Long a leader in mid- to large-sized units, Humphreys says the company has developed an as-yet-unpriced model capable of digging up to a 100-inch root ball that is also within all legal width and height requirements for over-the-road transport. “That’s always been a kicker for spades of this size, but we’ve done it.”

Big John is also working to develop and deliver a line of production diggers for nursery use that includes balling and burlapping in the smaller-end 42-, 32-, and 28-inch units.

With an established technology in place, innovation is the name of the game in what is becoming a worldwide market.

Paul Bennett, one of the owners of Tennessee-based Bennett and Bennett Enterprises, the exclusive source of the German-made Optimal Tree Spades, says that continuing demand for larger trees is driving the market.

“Companies that produce larger truck-mounted machines have figured that out and are looking to build even larger (ones) that are efficient to use and economically feasible,” Bennett reports.

A forester by education and by trade before becoming a purveyor of tree spades, Bennett says tree movers are looking to move up in size. Unfortu-
made, truck-mounted tree spade and soon after hired the Swiss.

When the operator had to stop at the first bridge and back around so as not to damage the branches, that’s when it became obvious that “he was carrying the tree the wrong way,” Bennett relates.

Recognizing opportunity, the inventor knew that two key factors had to be addressed — orienting the tree horizontally and in such a way that branches would not be damaged by wind, obstructions or power lines.

The result is an Optimal device now capable of 24- to 120-inch diameter root balls and transport of a 55-foot-tall tree down the highway.

Bennett stocks machines suitable for 16- to 120-inch diameter root balls. The company’s inventory ranges to 67 inch units. “After that, they are custom built. The 120-inch is custom built and costs about $1 million, Bennett quips. “For a million dollar tree spade, we will throw it in the truck!”

Another leading supplier is Dutchman out of Canada and Nebraska, which began producing tree spades in the 1980s. A longtime major supplier of large-caliper trees to the commercial/industrial landscapes beginning a decade before, Dutchman leveraged its “moving experiences” into a healthy machine business.

Today, Dutchman supplies units ranging from the large truck-mounted 48-inch spade with a coned “clamshell” suitable for deep taproot species such as pecan, oak and pear. Like some of its competitors, Dutchman makes a quick-disconnect system that will swap over from a truck mount to skidsteer.

These multi-use designs are aimed at providing versatility to the arborist (you don’t have to tie up a truck for one piece of equipment) and flexibility (you can get into tight spaces such as nurseries and back yards with minimal damage by shifting back and forth from small to large transporters).

The current economic downturn may be repressing consumer desire for instant shade somewhat. Nevertheless, spade manufacturers predict a healthy future ahead — for their equipment sales and for the trees that will be moved with them.

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Many fleets waste money by poor tire management. Here are some ways to save money and control tire costs.

Tracking Tires

Tracking your tires in use can tell you if a tire is wearing faster or slower than normal. A small fleet should not have a problem tracking the performance of every tire. The larger the fleet gets, however, the more of an issue this becomes because of the costs associated with collecting data. Bridgestone recommends large fleets track the performance of roughly 10 percent of their tires, but no fewer than 30 tires.

Bridgestone suggests tracking tire performance by measuring miles per 32nds of an inch of tread wear (i.e., the number of miles divided by the number of 32nds of tread worn away). The initial first or second 32nd-inch of the tread, whether on a new tire or new retread, wears faster than the rest of the tire. Multiplying the miles per 32nd by the number of usable 32nds remaining (subtracting the tread depth when the fleet normally removes the tire from use) should give you the total number of miles you’ll get from the tire.

By any account, tires are one of the three biggest expenses for fleets and for tree care companies that have many trucks out on the road. It naturally follows that fleet managers could spend a lot of time managing the fleet’s tires.

That’s not how Bill Padon wants to spend his time. Padon is warehouse operations assistant for Harvey Industries Inc., a custom window manufacturer and building supply business based in Waltham, Mass. Most of his time is spent managing the warehouses at several of the company’s 26 locations, as well as helping to design new ones. But Padon is also responsible for managing the company’s fleet of 176 trucks and vans.
Top Tire Tips

Here are some tips from various sources intended to help you control or reduce your tire costs:

♦ Train employees. Have every tire technician certified by the International Tire & Rubber Assoc. For more information, call 1-800-426-8835, or go to www.itra.com.
♦ Set up a structured tire management program that, at the least, includes air pressure checks on a regular basis by everyone who touches the truck.
♦ Issue a good tire gauge to each of those employees.
♦ If you use retreads, get to know your retreader. Visit to see how it’s done and to let the retreader get to know you and your employees.
♦ Work with the dealer to determine the best time for them to handle tires.

Given his other duties, Padon has no problem saying he pays little attention to the tires on the company’s trucks. That’s someone else’s job. In his case, most of that responsibility falls to Pete’s Tire Barns Inc., in Orange, Mass., the largest independent tire dealer in New England. PTB is not the only tire contractor Harvey Industries uses, but it has roughly 90 percent of the business. The rest is handled by local tire shops outside PTB’s area.

Like many tree care companies, Padon says his company “was forced into the trucking business,” referring to the necessity of having a fleet for the company. “We don’t even want to be in the trucking business, never mind the tire business. This way, I let them handle it and I don’t have to worry about it.”

Pete’s Tire Barns has been managing the tire program for Harvey Industries for 23 years, maybe longer. “At least as long as I’ve been here,” notes Padon.

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TREE CARE INDUSTRY - NOVEMBER 2002
“Handling it” for Harvey Industries means structuring a regular tire maintenance and replacement program that might be all but invisible to Padon because PTB does all the service work on weekends. Mechanics from Pete’s Tire Barns regularly visit all of the Harvey Industries locations under contract to check tires. They record data such as tread depths, air pressures and wear rates on all the units and track the performance of each tire. Any service work is scheduled for the weekend, beginning Saturday afternoons, when all the trucks are back in the yard.

Harvey Industries spends about $120,000 annually on its tires and tire programs. Is it worth it?

Padon judges the tire service not by the amount spent, but by the amount of downtime, and he reports they don’t have downtime during work hours from tire problems.

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**Calculating Tire Costs Per Mile**

Track your tire costs by calculating their costs per mile. The formula itself is simple: divide total tire costs by mileage. The complexity depends on how many factors you include in each element. Here is a formula suggested by Bridgestone.

Tire Cost = [Acquisition price + Federal excise tax + mounting and balancing (initial)] + [Repairs + Maintenance costs + Mounting and balancing (after repairs)] + [Retreading + Mounting (after retreading)] + Tire disposal fees (or - Casing trade-in value)] Divided by Mileage (Original tread mileage + Retread mileage #1, #2, etc.).

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TREES CARE INDUSTRY - NOVEMBER 2002
The most noticeable value to me is downtime reduction. Downtime costs you dearly and I can’t afford that. We have enough downtime with motor problems and other types of mechanical problems, but we just don’t have trucks that go down because of tires. That’s the way I want to keep it,” he insists.

Earl Richmond, sales manager for Pete’s, judges the value a little differently. “If we’re doing our job well, his costs will stay consistently low. The fleet keeps growing, but his expenses don’t,” he explains. Our responsibility is to have the tire size they need in inventory at our service locations. They’re very busy, and they don’t have places to keep them. It’s a conscious decision to take them out of the tire business.”

With one exception, Pete’s doesn’t store any tires at Harvey Industries facilities. The PTB tire technician brings and takes everything with him on these jobs.

“He doesn’t have to pay for what he’s not using,” says Richmond. “He’s got so many locations, it would be nothing to add a few tires at every location and have an extra $30,000 expense. We’re committed to making sure that’s not an issue.”

With 14 stores and more than 100 service trucks, Pete’s Tire Barns is one of the largest commercial tire dealers in New England. The company sells more than 200,000 tires annually, but Richmond says much of the company’s fleet focus is helping fleet managers like Padon manage and control their tire costs. About 80 percent of PTB’s business is commercial. How does this program translate for tree care companies — especially ones with “fleets” of four to six vehicles?

How to control costs

Let’s say your tree care company’s fleet currently has no structured tire program. How much money are you throwing away?

“If there is a fleet with no (tire) program, nine out of 10 times we could walk into that fleet and save them 5 to 10 percent right away,” claims Rene Leblanc, Pete’s fleet consultant.

What’s the best thing a fleet manager or his tire dealer can do to help control tire costs?

The first thing is to set up a preventive maintenance program that, at the very least, ensures that the tires are kept at the proper air pressure. Anyone working with tires — including the tire manufacturers, the tire dealers, and good fleet managers — will say the most fundamental mistake fleets make is to ignore the tire’s air pressure. Establishing a program that trains and requires mechanics and drivers to regularly check and maintain proper air pressure is the first step toward cutting tire costs.

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TREE CARE INDUSTRY - NOVEMBER 2002

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Maintenance Council, underinflation by 10 percent will shorten tread life by 9 to 16 percent. Overinflation is no better.

"Underinflation is the most common problem, but overinflation can kill a tire, too," reports Leblanc. "Overinflation results in a lot of blowouts. When the tire hits something, such as a pothole, it impacts it, instead of rolling over it as it would if it had right amount of air."

Fleets that do their own tire work are sometimes their own worst enemy when it comes to wasted money and poor tire management. The biggest reason is because they don’t train their mechanics, says John DiLuna, fleet manager for Stop & Shop Supermarkets.

"Training is absolutely the key element," DiLuna stresses. "We all need to be trained to maintain tires and know what to look for. And I mean everyone in the shop, not just the tire man. You can have the best tire in the world, but if you’re running it too low or too hot, you’ll ruin it."

The technicians in DiLuna’s shop have been trained both on how to work with tires and also to diagnose problems.

Leblanc agrees. "Most mechanics can tell you exactly when they changed the oil last and checked the brake shoes. But barely one out of 100 can tell you when they checked the air pressure last."

After air pressure and training, the next most important thing fleets can do to control their tire costs is to have the right tire for the application. That’s not as simple as it used to be.

"Michelin alone makes 15 different drive tires we could put on Harvey Industries’ trucks," Leblanc says. "The challenge is finding the right tire for the application. (Manufacturers) today are going application specific. That’s good if you find the right tire for the right application. That’s the best marriage in the world."

Picking a tire dealer

Using a tire dealer to either manage or assist with the fleet’s tire program may help. When selecting a tire dealer, use the same criteria you would when shopping around for most fleet services.

Service, in fact, is the top issue. You need to find out a dealer’s service capabilities. According to Richmond, these include determining where, when, and how often the tires will be serviced. Also, find out what training or certification the technicians have and what brands the company carries. Even questions that the dealer asks of the customer will give an indication of how much the dealer knows or cares.

DiLuna insists on visiting any prospective tire supplier, including retread suppliers.

"Look at their basic services," he suggests. "Do they pick up and deliver tires?
It’s tough enough to get arborists with CDLs. And fleets don’t have much control over fuel. So, the only real place they have to take a serious look at cutting costs is their tires.

“Whether you’re a two-truck operator or running a 5,000-truck fleet, you can save money by doing it properly,” he says.

This article was reprinted with permission from the June 2002 issue of Light and Medium Truck. For more information on Light & Medium Truck, visit www.ttnews.com/lmt.

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WORKAHOLIC.
Most tree companies need several things to stay in business: Good grounds workers, a great climber, decent equipment, and most importantly, money. Without money, the first three needs are hard to keep. However, to obtain money, the first three are needed. Once all of the bugs are worked out of one's company, and all four needs are in place, then companies can thrive to success. Unfortunately, it takes a long time to get to that point.

On the money issue, it takes a lot of it to keep everything running smoothly within the company. Money for hands, equipment, gas, advertising and dump fees can sometimes take a toll. There isn’t always enough to go around. Below are a few money-saving tips for those companies just beginning or in the “first couple of years” stage. Actually, just about any company can use some of these tips. It never hurts to save a few extra dollars now and then.

Equipment

One of the best ways for a company to save money is through its equipment. There are several ways to save the money in this category, and sometimes, spending more money can actually save money. Take ropes, for example. Samson’s Arbor-Plex ropes for climbers are sold by arborist supply companies by the foot or by the roll. On average, most retail stores sell the rope from 60 cents a foot to 70 cents a foot. These same stores sell the
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Arbor-Plex rope by the 600-foot roll from $239 to as low as $219. That’s only 40 cents to 36 cents a foot. If a 100-foot rope is bought six times throughout the year at $65 each, the same 600-foot roll ends up costing $390, which is $170 more than buying all at once. All prices are different, depending on the type or brand of rope and the retailer, but generally, savings always occur with buying in bulk.

This also holds true for cutting chains. A 20-inch, 3/8th pitch, 50-gage Oregon chain runs around $25. If a company buys 25 20-inch chains throughout a year, it will spend roughly $625. A 100-foot roll of the same type of chain will make about 25 chains, yet will cost only around $400. That’s a $225 savings. Factor in the cost of a bench chain breaker and rivet spinner (about $200 for both, depending on the brand) and it is almost an even break the first 100-foot roll. The savings will come with the next chain roll purchase.

Chain saws are another area of saving money. Unfortunately, it is a little harder to buy these by the bulk, so smart shopping comes into play here.

Most large towns have a couple competing dealers for chain saws who will sometimes make better deals for a customer if the customer knows the prices offered by their competitors. Customer satisfaction is a dealer’s main concern, so if saving a customer an extra $20 off the purchase satisfies the customer, then the dealer will usually knock it off. The same goes with an extra chain or carrying case. A lot of retail companies offer this with the purchase of a new saw. If a customer doesn’t want the free items, sometimes he can request the cost of those items to be removed from the cost of the saw. A one-year warranty can also save money on the purchase of a saw in the long run. It’s not a pleasant feeling when the saw breaks down two weeks before it is a year old and with no warranty on it.

There are several other pieces of equipment that are crucial to the tree service industry, and most of them can be found at a better price at one place than another. Research can help a lot when it comes to finding good deals, and every little bit helps. From bar and chain oil to files and rakes; from chain saws to trucks to chippers, there’s always a sale going on somewhere. It’s amazing how much money can be saved with a little patience in purchasing.

**Advertising**

A lot of money is wasted every year in advertising that doesn’t pay off. The best way to find out if advertising dollars are being spent wisely is to track every call from a potential customer. If the person taking the phone calls for the tree service company simply asks the customer where he heard about company, within two or three weeks there should be a good idea of which advertisements are doing well, and which ones are not.

One tree care company in Dallas, Texas, did a poll on its advertising and was shocked at the outcome of the survey. They had advertisements in two different phone books, the local newspaper, and mailbox drops once a month. Out of 100 calls, they discovered that 89 calls came from the two Yellow Page ads, 10 calls came from the mailbox drops, and only one call came from the...
newspaper. After the survey, they dropped the newspaper and began saving $120 a month, and never noticed a change in call volume. They did, however, notice the $1,440 a year savings. Other companies, on the other hand, have found that Yellow Pages advertising generates a good volume of calls, but those calls tend to be from price shoppers looking for the lowest cost. Track your advertising and find out.

Employees

Employees are one of the highest expenses of tree care companies anywhere. They are the most important as well. So how can a company save money on employees? If a job requires four employees, then it will be very hard for three people to complete it. Also, by the end of the week, the quality of work will be lower if three employees are doing the same amount of work as four people. So letting employees go is generally not an option.

Here is one way a company began saving a little money on the cost of employees:

One company used to advertise for groundworkers at $8 per hour, but hardly ever got any calls for the position. They considered raising the rate to $9 per hour to attract more applicants, but knew that it would be more difficult to make payroll every week. So instead of advertising that, they started advertising $8 per hour plus lunch. When this was submitted into the papers, their calls were phenomenal.

This is how the owner looked at it: He knew that he had to offer something more than $8 an hour as starting pay, but also knew that paying an extra dollar per hour for one employee would raise his insurance and other payroll costs. It would also mean that the other employees would probably feel they should get the same $1 per hour raise. Four employees at a dollar more per hour more came out to $32 a day for an eight-hour day. That was $160 more per week. When he decided to go with the free lunch for the employees instead of the raise, he figured the average cost of lunch for each to be about $4. That came out to $16 dollars a day, and only $80 more per week, which was an $8 per week in savings.

This also added a little motivation to the employees each day. They got a chance to leave the job sometimes, unless the owner brought lunch to them, and it broke the everyday routine from the same old thing all the time.

Some of these tips can be worked into certain companies, and some cannot. It basically depends on the company and its needs. When trying out new things, or purchasing products in new ways, it always takes some time to work out all the bugs – especially when it comes to doing things differently with employees.

Equipment and advertising changes are generally easy. The best way to change any of them is to take a survey and check over receipts to see where most of the extra money is being spent, and where the best places are to cut back a little. Just taking the time to look at things from a different angle helps. This holds true in saving money, employee relations, customer relations, and just about every other aspect of running a successful tree care business.

James Mayes is the owner of Tree Care of Denton in Krum, Texas.
New California Tree Law

By Randall S. Stamen

As most of us in the arboriculture industry know, a California homeowner ordinarily does not have a right to a view through a neighbor’s property. A homeowner cannot successfully sue a neighbor because the neighbor’s trees block the homeowner’s view. The “no view” rule recently changed in a roundabout way.

A California Court of Appeal ruled in Wilson v. Handley, that a homeowner may use California’s spite fence statute to preserve a view through a neighbor’s property. The statute, Civil Code section 841.4, provides that “any fence or other structure in the nature of a fence unnecessarily exceeding 10 feet in height maliciously erected or maintained for the purpose of annoying the owner or occupant of adjoining property is a private nuisance.”

A homeowner may file a lawsuit based upon the statute and request a court order that the spite fence be reduced in height or removed. A homeowner may also exercise “self-help.” The homeowner may reduce the height of the spite fence or, if necessary to preserve his or her view, remove the fence. A homeowner who exercises the risky self-help option must give the fence owner reasonable notice of the reduction or removal and cannot “breach the peace.”

Three requirements must be satisfied to prevail in a spite fence lawsuit. First, a “fence or other structure in the nature of a fence” must be at issue. Second, the fence must “unnecessarily” exceed 10 feet in height. Third, the fence has to be maliciously erected or maintained to annoy a neighbor.

Wilson vs. Handley is a precedent-setting case because the court ruled that a row of trees may constitute a “fence or other structure in the nature of a fence.” Thus, the spite fence statute may now be used in tree disputes.

In Wilson v. Handley, a row of spruce and cypress trees was at issue. The row of trees was planted approximately 10 feet from the property line that the tree owners and neighbor shared. The trees were planted when the neighbor began building a two-story home on her property. The neighbor filed a lawsuit because she feared the trees would block her view of the mountains.

In addition to ruling that a row of trees may constitute a fence, the Wilson v. Handley court had to address the “unnecessarily” tall requirement of the spite fence statute. The court ruled that a row of trees unnecessarily exceeds 10 feet in height unless the height of the trees serves some purpose other than marking the property line between two neighbors. For instance, it may be necessary for the trees to be taller than 10 feet to preserve the beauty of the trees or to preserve the privacy of the tree owners’ property. Finally, the Wilson v. Handley court had to determine whether the trees were maliciously planted or maintained to annoy the neighbor.

The use of the spite fence statute in a tree case adds another wrinkle to the tree/neighbor/view disputes that arborists, public entities, and homeowners associations regularly encounter. All of us in the arboriculture industry should keep the statute in mind, as this type of dispute is becoming more frequent in California’s real estate market.

Randall S. Stamen is an attorney and certified arborist in Riverside, Calif.
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With new tree care companies opening daily, it can seem like a never-ending competition... just trying to set yourself apart from the pack. What do you do?

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A delicious buffet lunch awaits.

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There's nothing like putting on an emerald green surface as the snow piles up back home. You are welcomed to an afternoon of relaxation and friendly competition – all for a good cause.

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Ecological Life Zones of Puerto Rico Seminar

Based on the Holdridge Model of latitudinal region, altitudinal belt and humidity province with variables of mean annual precipitation and mean annual biotemperature, participants will briefly explore the six classifications of plant formations of the Commonwealth of Puerto Rico and the U.S. Virgin Islands so as to better understand the fragility and unique nature of the plant-animal communities of this region.

Rain Forest Tour

El Yunque is the only tropical rain forest in the U.S. National Forest System, spanning 28,000 acres and reaching an elevation of 3,624 feet. The area receives over 100 billion gallons of rainfall each year, coming in very brief rainbow showers that end almost as soon as they begin. There are more than 240 different species of trees, tropical ferns and bamboo groves. Adding color to the lush greenery are clusters of tiny orchids and...
other beautiful flowers. More than 200 species of colorful birds, splashing falls and cool shaded pools complement the total enchantment of the forest.

Old San Juan Shopping Shuttle

Out of Puerto Rico’s Spanish heritage comes an extraordinary love of the lively arts and pride in preserving the past. The galleries, museums and narrow streets of Old San Juan offer a history lesson at every turn. Explore the sites of the Old City by foot and visit the 16th century San Cristobal Fortress, Gothic Style cathedrals and bustling plazas and enjoy the many bargains in the shops of Old San Juan.

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Discover Puerto Rico the way the pirates did. Treasure maps, gold coins and swashbuckling pirates will be your companions on this exciting evening. The tropical night, flaming tiki torches and swaying palm trees will take you back to those ruthless times.

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Picture an almost endless choice of vacation pleasures on one mile of romantic, palm-lined beach in the shelter of lush mountains and you have the Westin Rio Mar Beach Resort & Country Club ... this year’s venue for WMC 2003.

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Travel information

Remember travel reservations should be made early as this is a vacation destination and choices will be limited the longer you wait.

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For more information, call 1-800-733-2622 or visit the NAA Web site at www.narlab.com. It’s time and money well spent.
Volunteering Can Make a Difference - Locally

By George Klinger

Everyone can do something. Answer President Bush’s call to service. You can make a difference by volunteering your help “one person at a time.” When you volunteer to help religious, social, academic or charitable groups, sporting and emergency service organizations, you help your neighbors, friends, associates and your nation. It’s the small things in life that count. Everyone can do something.

Our country, as well as the National Arborist Association, is built upon the life-blood of volunteers like you and me in order to survive and perpetuate. We are the heartwood (member support), sapwood (perpetuation), and cambium (new-member recruitment) vital to the growth of national tree organizations, ANSI, and local shade tree commissions. This is why we should take great pride in the organizations in which we volunteer and belong.

For over half a century, I have been involved in the tree industry, with 15 years as a commercial and utility arborist. For more than three decades, my focus has been on tree worker safety. (Once a tree-man, always a tree-man – with safety as my mission.)

This article is not about me, however, it’s about we.

What can we do as volunteers? We aren’t limited to national organizations. I have served on ANSI Z-133 for over 20 years and am an active member of the NAA Safety Committee, but I also serve local organizations, such as the New Jersey Shade Tree Federation, New Jersey ISA, New Jersey Safety Council, New Jersey Community Forestry Council and Open Space Land Preservation Committee. In addition, I chair the Freehold Township Shade Tree Commission. Volunteering for these organizations has given me great satisfaction and personal pride.

Try it in your area; everyone will gain.

This year, on Aug. 11, 2002, our Shade Tree Commission held a special, private tree dedication ceremony for eight local Freehold, N.J., residents who perished on 9/11 at the World Trade Center. It was attended by over 60 invited guests, relatives, friends and neighbors of those who died in the tragedy.

What more befitting tribute could there be than to dedicate a “Living Memorial Tree” for each life lost, with personalized plaques from their loved ones. I created a memorial theme for the large central plaque (above), and as an Aetna Insurance Company retiree volunteer, I was able to receive a grant for it. The plaque was displayed at the center circle of trees in our arboretum, dedicated to those who perished in the 9/11 tragedies. For me, it was both a heart-warming and tear-jerking event, but it was something I felt I had to do.

I have also volunteered to share my experiences through writing for this publication and others. You can too — and don’t use your grades in high school English as an excuse. English was always my poorest subject in school; however, I gave it a shot and survived with the assistance of TCI’s editor. My first safety article for TCI was in 1997, and since then I have authored eight articles on loss prevention keyed to arborist safety. Try it — you might enjoy sharing your wealth of knowledge with fellow arborists.

I was honored to receive the initial Pat Felix Volunteer of the Year Award from the NAA last year. I want to share with you my pleasure and feelings of pride at receiving this award. I believe that you, too, will gain a grand sense of accomplishment for your time, effort and dedication devoted as an NAA volunteer.

If you haven’t come aboard, try it by volunteering. Remember, everyone can do something – one arborist at a time – to make the country and organizations like the NAA stronger and better for fellow arborists.

George J. Klinger is the Director of Loss Prevention for National Insurance Programs (TreePro) of New Jersey.
Volunteering Can Make a Difference - Nationally

By Cynthia Mills

George Klinger is the quintessential volunteer. Even this article is a great example of volunteerism. George called me and said, "Let's do an article together." Step 1 - Initiative on the part of the person who wants to find a way to give. Step 1 for the organization - ask! That is the No. 1 way to find new and great volunteers.

I was contacted this week (early September as I write) and asked to contribute to a magazine article on attracting younger volunteers. They were particularly interested in my viewpoint because I had been named the volunteer president of a professional society at a young age. Without thinking about this article yet, I responded that the short answer as to why I agreed to volunteer was, "They asked." The longer answer was they asked and they kept asking. Aside from the honor of serving, the plus was the tremendous learning opportunity. The community of people and leaders it brought me in touch with helped me to grow personally and professionally in ways I could never have dreamed of.

And that brings me to mentoring. Your participation as a volunteer over a period of time inevitably leads you to mentor other volunteers, whether you know it or not. Just by observing you, your contributions and dedication, those who are coming along will be influenced positively. By speaking out like George has, others can recognize that when you volunteer, you inevitably gain more than you could possibly give.

As with George, volunteerism is in my blood. I had two amazing examples to follow: a Lutheran minister and a Christian educator for a father and mother - two people who have lived life quietly showing what just being there and being a part of community can do to make a difference. Yes, they both were involved in the causes and activities you would expect of two people who made a commitment to religious life professionally. But there were also civil rights marches, PTA, providing recreation and church services for campers at a local campground all summer; American Cancer Society; all the quiet ways of taking food to ill and elderly neighbors; and anonymous charitable donations.

You see, this was so much in my blood that I didn't even realize it until a reporter who was interviewing me pointed it out. It started in school decorating a coffee can...
to collect UNICEF funds and went on to student government and all sorts of school activities. From the campground volunteer summers, it came as a bit of a shock that I might need to go and do something for money before going to college. And at college, a similar pattern of volunteering continued.

When "real life" happened, I fell into this world of association management, only to find out some of the best people in the world inhabit its rooms—both volunteers and staff. The people who choose to work at not-for-profits have made values choices about what they want out of their professional lives and how they define success. You won't find more special people anywhere than those who dedicate their lives to working with volunteers. You see, I’ve been blessed to work at three associations, and those staffs are some of God’s gifts to this world.

What makes it all worthwhile are the volunteers you meet and get to work with. People who truly give of themselves to a cause, profession, or industry have the best of intentions at the core of their time and actions. One of the gifts to volunteers are the lifetime friendships. They come from bonding over accomplishments, tough choices and life decisions. These friendships will find you in the best of times and will be there to celebrate with you. They will help you in your low moments and sometimes save you tremendous time when you are problem-solving.

Volunteering is one of the most noble things you can do with your life. At its best, it is about putting others or the greater good before yourself. This very act of doing has been proven in many studies to be a key to people pulling out of depression and grief. The act of taking care of others—joining the community and sending energy outward—is a healer. And the magic of that is that even more positive energy flooding back to you.

It’s all about being a servant leader. I watched this come to life once. Two leaders served the same organization (not NAA) back to back. One gave power away, embracing all the talents and possibilities of those around this person and feeling so honored to have the opportunity to serve. This person’s focus was on leaving the organization in the best possible place for the future, not on building a personal legacy. The adoration and thanks of those who were helped and involved came flooding back. Consequently, this person is one of the most beloved leaders of all time.

The other leader focused on appearances—of the person, organization and activities. This person was interested in getting to do things as the No. 1 representative and being owed opportunities because time or money had been put in. The organization began to focus internally, instead of on achieving its external mission. This person was so puzzled by why the same adoration of the previous leader did not come pouring back. The perception was, "So much hard work has been put in, why am I not getting such a response?" What this person never understood was that it was never supposed to be about the volunteer. It was supposed to be about everybody else.

There are all sorts of statistics out there that show baby boomers weren’t joiners. Membership numbers at Masons, Rotary and other bastions of 20th-century community plummeted in the ‘90s. They have struggled with required meetings and groups that sing songs at lunch. Meanwhile, Gen Xers and the Millennials text message each other in Europe and form “meetings” to get things done without organizations. You see, the question isn’t whether people will see a need and meet it. Volunteering is not really on the decline. Volunteering as it was defined in the 20th century may very well be.

Our job is to take the blessings and enthusiasms of people like George and find out how to make it relevant in the 21st century. You see, I don’t believe people are too busy to volunteer. I believe people make time for what they find as valuable ways to spend their time. I also believe that finding help is as simple as asking. The trick is to match the skill set needed with the right person who has an interest—and then not ask them for a 10-year commitment, but for a job well done in the short term.

Volunteers are the life-blood of our society, and I mean our human society. Governments are never going to meet the needs of our population, and they are neither fast enough nor flexible enough to be responsive to our changing needs. I do believe that you have to earn the right to occupy the space you take up on this earth, and that starts with caring about the people in our space—being givers and not takers.

Here’s to the Georges of the world who know where the true value is found in life and are willing to shout it to the rooftops. May your life be blessed with years of giving and servant leadership.

Cynthia Mills, CAE, is president of the National Arborist Association.
Make a Difference - Through NAA

NAA is fortunate to have hundreds of volunteers who serve on committees, task forces, and as mentors for others in the profession. Being involved with NAA brings rewards upon which you cannot put a price tag.

As an NAA member volunteer, you have the opportunity to actively influence policy and change the industry. You can make friendships that stay with them for a lifetime. Being with peers provides opportunities to take home success stories and implement the “how to’s” in your own business. Seeing the industry from a much larger perspective can be inspiring when you’re back at home. Working with your peers as you lead an industry is an exciting personal and professional growth opportunity for every member. Don’t miss out!

NAA members who wish to volunteer should contact the staff liaison listed with each committee.

**Associate Member Advisory Committee**
The Associate Member Advisory Committee provides an ongoing conduit of information about associate member needs to the NAA staff, assists in developing mutually beneficial partnerships within the industry, and supports the work of the strategic plan.

**Volunteer Chair:** Royce Boyles
**Sachin Mohan, Staff Liaison. E-mail:** mohan@natlarb.com

**Business Management Committee**
The Business Management Committee increases the business management programs, products and services offered to members and non-members, primarily through NAA’s “Business Management Academy.” It provides educational resources and programs to meet the changing needs of our members via online learning, as well as regular regional business management seminars and workshops.

**Volunteer Chair:** Arthur Batson
**Phil Boutin, Staff Liaison. E-Mail:** boutin@natlarb.com

**Education & Employee Development Committee**
The Education/Employee Development Committee helps identify, prioritize and develop NAA’s technical and other employee-directed education/training programs, including TCI EXPO and other seminar program content. This committee creates fundamental and vital programs for members.

**Volunteer Chair:** Erik Haupt
**Tim Walsh, Staff Liaison. E-Mail:** walsh@natlarb.com

**Governmental Affairs Committee**
The Governmental Affairs Committee monitors legislative and regulatory issues relevant to the NAA membership. It helps implement strategies to address issues, such as grass-roots letter writing campaigns, visits or correspondence with key legislators or regulatory officials, working with regulatory people to develop solutions, submission of written comments or testimony, or further legal action.

**Volunteer Chair:** David Marron
**Peter Gerstenberger, Staff Liaison. E-mail:** peter@natlarb.com

**Safety Committee**
The NAA Safety Committee promotes safe work practices in the tree care profession. It helps develop and approve comprehensive safety programs for release to members and monitors development of the ANSI Z133 Standard to make timely recommendations to the ASC Z133 Committee.

**Volunteer Chair:** Joe Tommasi
**Peter Gerstenberger, Staff Liaison. E-mail:** peter@natlarb.com

**Tree Care Standards Review Committee**
The Tree Care Standards Review Committee (TCSR) represents the NAA position in the development and revision of tree care performance standards by directing the vote of the NAA representative on the ASC A300 committee and reviewing other industry standards that could affect the performance of tree care maintenance operations. The TCSR promotes the use of ANSI A300 standards among our members.

**Volunteer Chair:** Peter Becker
**Robert Rouse, Staff Liaison. E-mail:** rouse@natlarb.com

**Utility Committee**
The Utility Committee identifies issues of concern or of interest to the utility contracting segment of the membership and recommends appropriate action.

**Peter Gerstenberger, Staff Liaison. E-mail:** peter@natlarb.com

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[Image: Arborwear]

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- Timely e-mail notification of upcoming events, new products and new services available through the NAA and its partners.
- Best of all, being a part of the NAA Tree Care Business Inner Circle won’t cost you a dime – it is 100 percent FREE! To subscribe, go online to www.natlarb.com or call 1-800-733-2622.

### Industry Inner Circle

What if you want the benefits of being a full-fledged NAA member but are ineligible? The NAA’s newly created Industry Inner Circle subscription has been crafted specifically for you – utility arborists, municipal arborists, academics and students.

The benefits of being an Industry Inner Circle subscriber are numerous. As a subscriber, you will receive:

- *Reporter* newsletter via e-mail. This monthly newsletter will keep you informed of the latest inside information on tree care businesses. Features including “Safety Corner” and “Hotline Question of the Month” offer practical solutions to real-life business challenges. From regulations in Washington that affect tree businesses to news of events and people in the profession, the *Reporter* is the voice and resource for successful companies.
- *Tree Care Manager* e-newsletter.
- *The Treeworker* via e-mail. This monthly newsletter is written by arborists primarily for field employees. Each colorful issue provides “how-to” pointers on important subjects, such as improving client relations, rigging and avoiding vehicular accidents. Tech Notes, Knot of the Month, Safety and Pest Alert features make this monthly publication “must” reading for company owners and field employees alike.
- NAA Annual Wage & Benefits Survey results via e-mail. The data generated by this survey of NAA’s Active Member firms provides you with current, detailed, region-by-region wage rates, as well as other demographic information, including sales levels and benefits.
- PLUS, as part of the subscription, you will receive the full-color, glossy *Tree Care Industry* magazine in your mailbox every month! *TCI* is simply the best publication available in the business of caring for trees, shrubs and other woody plants. Each month, *TCI* is packed with informative articles on subjects such as soil biology and tree chemistry, line-clearance trends and training issues, transplanting and pruning practices, new products and equipment, rigging techniques, and real-life “From the Field” experiences.

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See us at TCI EXPO 2002!
Trade shows like TCI EXPO are great for discovering new products and making new contacts. All too often, though, arborists return to mountains of backed-up work. Faced with the challenge of catching up on work-a-day tasks, they soon forget their good intentions to follow up with vendors, cultivate personal networks, and capitalize on industry trends revealed at the show.

It shouldn't be that way. "What you really go to a trade show for is what takes place after the event is over," says Francis J. Friedman, a trade show specialist and president of the New York City-based consulting firm Time & Place Strategies. Like golfers working on their follow-through, successful TCI EXPO attendees are always trying to improve the quality of their after-show swing. That means sharing knowledge with staffs, placing follow-up calls with the right exhibitors, and organizing...
business cards and notes so they don’t end up on a shelf collecting dust.

But is attending a show worth the effort in the first place, when so many products can be seen in full-color catalogs? Most people say yes. “Show time is very well spent,” insists Joe Murtagh, president of The Source, Goshen, N.Y. “Where else can you have such concentrated exposure to such a vast array of information that is very well organized and presented? There’s nothing like being able to see the quality of goods and hold it in your hand.”

Given the benefits of trade shows, it’s clear that everyone will be attending more of them. Here are some techniques, then, for capitalizing on what’s learned at the show after you return home:

Share the wealth

If one piece of new information from a show can help you make more profit, imagine the results if your whole staff could use the same knowledge when dealing with customers. Make sure everyone has an opportunity to benefit from the TCI EXPO information – be it educational information from seminars, industry insights from business peers met in the aisles, or new product descriptions from the booths. This communication may be delivered via memo, meeting, or internal e-mail. The key is to disseminate the information formally so that it is taken seriously.

Don’t forget communication is a two-way street. Encourage your personnel to share insights that may enhance or alter your view of what happened at the show. This is particularly important when making decisions to take on a new line of goods or services.

“Your staff may know of products that are a better fit and should be compared and investigated,” says Richard J. Brunken, a partner at Humber, Mundie and McClary, a group of psychological consultants in Milwaukee. “You may discover that you were being overwhelmed by an enthusiastic salesperson.”

Good post-show follow-through depends to a great extent on advance planning. If more than one person from your business will be attending the show, assign different duties to each. Personal beats might include new products, industry trends, and materials needed for a new plant health care or spray service.

To encourage great work, make sure each attendee realizes a report will be expected back home. “People engage in a very different level of note-taking when they realize they will be held responsible for teaching others,” says Pittsburgh consultant Mina Bancroft. “They realize they will really need to understand a subject.”

Finally, assign a high priority to the meeting in which knowledge is shared. “Prior to attending the show, schedule the follow-up meeting on your calendar so it doesn’t slip between the cracks later,” suggests Bancroft.

And how about those great technical and business management seminars? Wouldn’t your whole staff benefit from knowledge gained? Jot down the key points from the seminars and have a short but informative report distributed to your key personnel. Alternatively, purchase the recording of the seminar and have your staff listen to the tapes while driving to and from job sites.

Speaking of communicating news to your staff: What can you do with all those notes you scribbled as you walk the aisles? In the rush of business they can fall through the cracks. Too often they end up collecting dust on a shelf or disappearing into your file cabinet.

Develop a plan to efficiently process those notes. Go to the show with this plan in place and you will be able to maximize the profitability of your notes when you return to your business. Rather than enter all of your notes on a running series of pages, try dividing a notebook into sections by topics such as “new products,” “personnel changes,” “industry trends” and “government regulations.” Once back at your place of
business, process the notes by removing the pages from your notebook and inserting them into a vertical hanging file organized by topic.

Follow through with vendors

Exhibitors can be as forgetful as buyers when the trade show glitter has faded. If they move on to other things and fail to send promised information, everyone loses. Smart business owners will mark their calendars with ticklers to remind laggard vendors.

There are three benefits of prompt follow-through with vendors. First is the reduced risk of misunderstanding. Your memory of what an exhibitor said may differ from that of the vendor’s, and the latter may forget a deal that was not put in writing because of the rush of people at the show. So call and nail down your agreements. Second, calling can confirm schedules for on-site visits by vendor reps. Finally, you can avoid the disappointment that can arise when you wait too long to place orders. Many manufacturers are trimming production in response to a softening economy, so late buyers may have to stand in line behind early birds, or even be left out of the pipeline entirely.

Vendors will offer you a knee-deep pile of brochures and catalogs as you walk the aisles. When you return home, a stack of accumulated flyers can seem so overwhelming that you avoid looking at them for months. Ask vendors to mail catalogs and brochures to you, and sign a staff member to file them in an accessible way. You might want to sort the catalogs alphabetically by company, then create a Rolodex or computer database that references the company names by product or service for rapid access months later.

Finally, how about all those business cards collected during the show? Too often they remain wrapped in their rubber band cocoons, never to be looked at again. Try categorizing business cards on a scale of 1 through 4, with 1 being the most important to contact. Back home, make sure you call the 1 cards first. “I advocate writing relevant information on the back of the cards rather than on a separate paper,” says Brunken. “That avoids having to match things up at the office. On each card, note what was interesting about the product and what needs follow-up.”

If all sounds like smart networking, that’s because it is. Trade show experts encourage such relationship building. When an attendee actually follows through with vendors met at a show, a

light goes on with suppliers. You have brought to the attention of exhibitors that you are different. The results can be beneficial. Down the road, you may be called for a testimonial, or you may be offered something to try out because you have been responsive. And, of course, you will be the first to know of any buying opportunities.

Inform your customers

We’ve covered co-workers and vendors. Who but the customer is the ultimate reason for all of this TCI EXPO commotion? One way or another, customers need to be informed about what you have seen at the show. Either a special mailing or a section of your regular newsletter can be devoted to a report on what you learned about taking care of your customers’ trees.

As the comments in this article suggest, getting the biggest bang from the buck invested in attending TCI EXPO depends on how you sweep up after the dust has settled and the glitter has faded. “When you get back to your place of work, the important thing is to have a plan in place that prioritizes the information you’ve obtained,” says Bancroft. “I suggest that you start processing the

Find Out What Lies Ahead

Maybe you can’t forecast the future, but you can set the stage for your success by spotting important trends. An entire industry comes together at TCI EXPO. You can become more knowledgeable about industry trends and get an insight of what’s ahead for your market.

♦ Converse with booth staffers. Don’t just stop by and say, “Hi.” Watch for slow periods and introduce yourself for a chat. Talk with everyone. You’ll be surprised what you hear.

♦ Establish networks with peers. Build a community of like-minded, non-competing business owners in various towns, then follow up with them regularly through the year.

♦ Benchmark. Are you up to speed or ahead of the curve in management practices and equipment? Keep asking this question as you attend seminars and visit exhibitors.

Curiosity should be something you bring to the show. Take full advantage of this information-rich environment.

information while you are still in Milwaukee, and especially as you travel back home. Ask yourself, “What is the top thing I have learned and what will I do with it?”

To tackle the big pile of new information efficiently, in other words, break it into manageable pieces. “If you end up with information overload you will not be able to process any of it,” says Bancroft.

The more you keep your goals in mind, the more successful you will be as a TCI EXPO participant. Cultivate the employee, the exhibitor and the customer who as a group form a three-legged stool of post-show success. If you take careful aim at your target and follow through with a good after-show swing, you’ll land a business owner’s favorite hole-in-one: more profit on your bottom line.
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Golf course superintendent Mike McNulty was confronted with a difficult dilemma. Like many superintendents before him, he had to figure out how to get more light on his green, while only pruning and removing those trees that he knew for sure were causing the shading problem. And he had to justify any recommendations he made for cutting down trees to a committee bent on preserving mature trees while demanding a healthy green—and a consistently fast putting surface.

“Certain trees had been causing problems for many years,” says McNulty, of the Philadelphia Country Club. “It was either the trees or me.”

Fortunately, McNulty was able to find a solution that transformed his green, and left his membership intact. The answer: computer modeling.

Computer modeling

Computer modeling is a novel technique that not only identifies the trees blocking light, but is able to give a solution to the shading problem using computer software called Sunshader. It can even predict how a green will fare under certain hypothetical or “what if” conditions. This helps clients anticipate the effect that growing, pruning or removing trees will have on light conditions for years to come.

The first step is for consultants to collect data from the site. They determine the number and position of the trees and their three-dimensional shape, and the shade each one casts. Each tree is assessed based on the density of its canopy (in terms of how much light passes through), and according to its shape. This data—along with the shape of the green, its dimensions, and its latitude and longitude—is input onto the computer with the Sunshader software.

An astronomical algorithm then calculates the sun’s exact position at various times of the day and month, depending on what the client wants to know. The computer uses trigonometry calculations to determine precisely how many hours of light will hit any part of the study area; which trees are causing the shading problem; how much shade the individual trees will cast on the study area; and the pattern that each tree casts at any given

Hours of sunlight diagram (patented) illustrates the light conditions before any pruning and removal.

A consultant collects data for the construction of a computer model.
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diagram takes more than 35,000 calculations and processes them in a matter of minutes, or, in some cases, seconds.

Computer modeling is not cheap, however. The cost is $3,000 to $3,500 per site. But it’s the route that more and more golf course (as well as some botanical gardens and homeowners) are opting for. Why? Because it takes the guesswork out of pruning and tree removal, and helps justify difficult but sometimes necessary decisions (such as which trees to cut down) with precision that other techniques before have not had.

Hundreds of computer models have been constructed across North America since the technology was developed five years ago. Computer modeling has been used to assess lighting conditions in locations as diverse as East Lake Golf Club in Atlanta, Ga.; Point O’ Woods Golf and Country Club in Benton Harbor, Mich.; and Oak Hill Country Club in Rochester, N.Y.

The technology was developed in response to difficulties golf course superintendents and others in the green industry were having in getting enough light on their greens to keep their turf healthy. Over the past few years, many golf courses have been converting their greens from poa annua (referred to as “poa”) to bent grass, because poa grass is so susceptible to disease, explains Robinson. But while this solved one problem, it also created a new one: bent grasses require much more light than poa, so without changing the light con-

Taking a series of photos at different times of the day can produce valuable information on light penetration.

Other Methods of Pruning for Light Penetration

By Scott Robinson

Most arborists have been called on to get sunlight into various locations, whether it be onto decks, docks and pools or onto plants on lawns, botanical gardens or golf greens.

But there are many challenges involved in pruning for light penetration. The biggest challenge is the fact that the sun moves drastically in the sky throughout the year, making it difficult to ensure that you get the amount of light the client wants at any time of year, without literally standing there with a stopwatch, timing the movement of shadows.

Computer modeling needs to be performed by consultants using specialized software. But there are other methods arborists can use to scientifically help their clients get more light reaching their properties:

The observation method

More than 90 percent of tree removal is done using the observation method. This is probably the simplest way of developing a pruning and removal program. The observation method is very effective in that it will ensure that you do not remove any tree unnecessarily. However, it is difficult to take into consideration multiple layers of foliage and hence may take several years of observations and subsequent prunings to achieve the desired results.

An organized and scientific approach will help ensure accuracy and help instill confidence in your clients. First, number all of the trees surrounding the area you would like to get more light. Number the trees using aluminum tags so that you can find the tree later to prune or remove it, and also post a 9-by-11-inch numbered cardboard sign so that you can make notes on how each numbered tree is blocking light.

You may also find it useful to use the following limb identification system. Divide the tree crown into the face of a clock (i.e., top
ditions, the turf was dying. There were other problems as well.

“Many superintendents told us that they were struggling with thinning surfaces, and dying or damaged grass from increased traffic on the greens. And they needed guidance in how best to prune, remove trees and plant in a way that would improve light penetration to the green now and in the future,” Robinson says.

Follow-up in Philadelphia

It has been more than a year since ArborCom first stepped onto McNulty’s green in Philadelphia. At the time, the grass was severely thinned and was suffering from anthracnose, a disease common to Poa grass. But things have long changed since then.

“The putting surfaces are now being mowed at one-tenth of an inch with a stimpmeter rating of over 10 feet daily,” says McNulty, using the jargon of the field. In other words, the grass is being cut very short, which means a fast green that golfers are ecstatic about.

In the meantime, they have had to cut more than 400 trees, based on computer modeling recommendations. But they have also been able to plant new trees using the guidelines. ArborCom gave them about the optimal height and distance the trees should be from the green.

So the Philadelphia Country Club has witnessed the death of old trees, but also has the promise of new life, with other trees being planted. And the membership is pleased with the changes to the green — and is no doubt playing a better golf game as a result!

Diana Ballon is a Toronto writer and editor.

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For Tree Care Operations -
Tree, Shrub, and Other Woody Plant Maintenance
Standard Practices (Fertilization)

DRAFT AVAILABLE
FOR COMMENT

An industry-consensus standard must have the input of the industry that it is intended to affect. The Accredited Standards Committee A300 was approved June 28, 1991. The committee includes representatives from the residential and commercial tree care industry, the utility, municipal, and federal sectors, the landscape and nursery industries, and other interested organizations. Representatives from varied geographic areas with broad knowledge and technical expertise contributed.

The A300 standards can be best placed in proper context if one reads the Scope, Purpose, and Application. If approved after the public review period, this document will present performance standards for the care and maintenance of trees, shrubs, and other woody plants. If approved after the public review period, this document will be used as a guide in the drafting of maintenance specifications for federal, state, municipal and private authorities, including property owners, property managers and utilities.

The A300 standards stipulate that specifications for tree work should be written and administered by a professional possessing the technical competence to provide for, or supervise, the management of woody landscape plants. Users of these standards must first interpret wording, then apply their knowledge of growth habits of certain plant species in a given environment. In this manner, the user ultimately develops his or her own specifications for plant maintenance.

When revised, ANSI A300 Part 2 - Fertilization, will continue to be used in conjunction with the rest of the A300 standards when writing specifications for tree care operations.

Cause 1 excerpted from ANSI A300 (Part 1)-2001 Pruning.
1 Scope, purpose and application
1.1 Scope
ANSI A300 standards present performance standards for the care and maintenance of trees, shrubs and other woody plants.
1.2 Purpose
ANSI A300 standards are intended as guides for federal, state, municipal and private authorities, including property owners, property managers and utilities in the drafting of their maintenance specifications.
1.3 Application
ANSI A300 standards shall apply to any person or entity engaged in the business, trade, or performance of repairing, maintaining or preserving trees, shrubs or other woody plants.
1.4 Implementation
Specifications for tree maintenance should be written and administered by an arborist.
10 Part 2 - Fertilization standards
10.1 Purpose
The purpose of this clause is to provide standards for developing specifications for fertilization.
10.2 Reason for fertilization
The reason for fertilization is to supply nutrients determined to be deficient to achieve a clearly defined plant management objective. That objective should be accomplished in the manner most beneficial to the plant and the environment.
Fertilization practices for agricultural and horticultural production or silvicultural purposes are exempt from this standard.
10.3 Safety
10.3.1 Tree maintenance shall be performed only by arborists or arborist trainees who, through related training or on-the-job experience, or both, are familiar with the practices and hazards of arboriculture and the equipment used in such operations.

10.3.2 This standard shall not take precedence over arboricultural safe work practices.
10.3.3 Operations shall comply with applicable Occupational Safety and Health Administration (OSHA) standards, ANSI Z133.1, as well as state and local regulations.
11 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ANSI Z60.1, Nursery stock
ANSI Z133.1, for Arboricultural Operations - Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements
29 CFR 1910, General industry
29 CFR 1910.268, Telecommunications
29 CFR 1910.269, Electric power generation, transmission, and distribution
29 CFR 1910.331 - 335, Electrical safety-related work practices


12 Definitions
12.1 drip line: A boundary on the soil surface delineated by the branch spread of a single plant or group of plants.
12.2 fertilization: The application of fertilizer to the soil or plant.
12.3 fertilizer: A substance containing one or more nutrients to be added to a plant or surrounding soil to supplement the supply of essential elements.
12.4 fertilizer analysis: The composition of a fertilizer expressed as a percentage by weight of total nitrogen (N), available phosphoric acid (P₂O₅), soluble potash (K₂O), and
other nutrients.

12.5 fertilizer ratio: The ratio of total nitrogen (N), available phosphoric acid (P₂O₅), and soluble potash (K₂O); e.g., the ratio of a 30-10-10 fertilizer is 3:1:1.

12.6 implant: A capsule or other device permanently inserted into the xylem.

12.7 nutrients: Elements required for growth, reproduction or development of a plant.

12.7.1 macronutrient: Nutrients required in relatively large amounts by plants, such as nitrogen (N), phosphorus (P), potassium (K), and sulfur (S).

12.7.2 secondary nutrient: Nutrients required in moderate amounts by plants, such as calcium (Ca) and magnesium (Mg).

12.7.3 micronutrient: Nutrients required in relatively small amounts by plants, such as iron (Fe), manganese (Mn), zinc (Zn), copper (Cu), and boron (B).

12.8 pest: An agent that can cause injury.

12.9 quick-release fertilizer: A fertilizer with less than 50 percent (50%) water-insoluble nitrogen (WIN).

12.10 salt index: The osmotic potential ratio of a fertilizer compared to sodium nitrate, based on the relative value of 100. The higher the salt index, the more likely that plant damage will occur.

12.11 slow-release fertilizer: A fertilizer with at least 50 percent (50%) water-insoluble nitrogen (WIN).

12.12 soil modification: Physically or chemically altering soils to improve conditions such as pH, drainage, aeration.

12.13 subsurface application: The application of dry or liquid fertilizer below the soil surface.

12.14 surface application: The application of dry or liquid fertilizer to the soil surface, mulch or ground cover.

12.15 trunk injection: The process of injecting a liquid into the plant.

12.16 water-insoluble nitrogen (WIN): The amount of fertilizer nitrogen that is not readily soluble in cold water. This number is calculated using a standard method and is printed on the label — if the fertilizer contains a significant amount. Refer to slow release, 12.11.

13 Fertilization practices

13.1 Fertilizer safety precautions shall be followed for all products.

13.2 Site factors shall be considered, including proximity to waterways, past fertilization practices, slope, and irrigation.

13.3 The types and rate of fertilizer — as well as, timing, method and location of application — shall be specified to achieve fertilization objectives.

13.4 Soil and/or foliar nutrient analysis should be used to determine the need for fertilizer.

13.5 Soil pH shall be considered when selecting the fertilizer.

13.6 New transplants and plants sensitive to fertilizer salt should only be fertilized with a slow-release fertilizer.

13.7 Plant conditions such as disease, insect infestations and herbicide damage shall be considered.

13.8 Root pest management to improve nutrient uptake shall be considered prior to fertilization.

13.9 Soil modification to improve nutrient uptake shall be considered prior to fertilization.
14 Fertilizer applications

14.1 Types and rates of fertilizer

14.1.1 When to fertilize: Fertilizer should be applied so that nutrients are best utilized by the plant to meet the objectives.

14.1.2 In the absence of soil and/or foliar nutrient analysis, a fertilizer ratio and rate should be selected based on the objective. Avoid balanced ratios (i.e. 1:1:1). These ratios should be adjusted based on local knowledge, species, age, and/or condition of the plant, as well as site conditions.

14.1.3 Slow-release fertilizers should be the preferred type.

14.1.4 Slow-release fertilizers should be applied at rates between 2 and 4 pounds of actual nitrogen per 1,000 ft² (1 to 2 kg N/100 m²) per application and should not exceed 6 pounds of actual nitrogen per 1,000 ft² (2.9 kg N/100 m²) annually.

14.1.5 Fertilizers with a salt index of less than 50 should be preferred.

14.1.6 Quick-release fertilizers should be used only when the objectives of fertilization cannot be met with slow-release fertilizer. Rates should be between 1 and 3 pounds of actual nitrogen per 1,000 ft² (0.5 - 1.5 kg N/100 m²) per application and shall not exceed 4 pounds actual nitrogen per 1,000 ft² (2 kg N/100 m²) annually.

14.2 Fertilization area

14.2.1 The fertilization area shall be defined prior to application. Consideration shall be given to root accessibility, root location, fertilization objectives, plant species, and site considerations.

14.2.2 For most trees and shrubs, the fertilization area should be from near the trunk to near or just beyond the drip line. Inaccessible surfaces shall not be included in the rate calculation.

14.2.3 For fastigate trees and unusual situations, the method for determining the fertilization radius is by multiplying the plant's diameter at 4½ feet (1.4 m) above ground, measured in inches (cm), by 1 to 1½ (0.12 to 0.18) to determine the radius, expressed in feet (m), from the trunk of the plant.

For example, a 15-inch (38.1 cm) DBH tree would have a fertilization area radius of 15 to 23 feet (4.6 to 6.9 m).

14.3 Surface application

14.3.1 Fertilizer shall be uniformly distributed within the defined area of fertilization.

14.3.2 Where turf or ground cover exists, subsurface fertilization should be the preferred method of fertilization.

14.3.3 Surface application shall not be made were surface runoff is likely to occur.

14.4 Sub-surface dry fertilization

14.4.1 Damage to the buttress roots should be avoided.

14.4.2 Holes shall be evenly spaced within the defined fertilization area.

14.4.3 Hole depth, diameter, and spacing shall be specified. Holes should be 2 to 4 inches (5 to 10 cm) in diameter, spaced 12 to 36 inches (30 to 92 cm) apart, and 4 to 8 (10 to 20 cm) inches deep.

14.4.4 The fertilizer shall be evenly distributed among the holes.

14.4.5 Fertilizer should not be closer than 2 inches (5 cm) to the soil surface.

14.5 Sub-surface liquid fertilizer injection

14.5.1 Damage to the buttress roots should be avoided.

14.5.2 Injection sites shall be evenly spaced within the fertilization area.

14.5.3 Injection site spacing and depth shall be specified. Injection sites should be 12 to 36 inches (30 to 92 cm) apart, and 4 to 8 inches (10 to 20 cm) deep.

14.5.4 Fertilizer shall be evenly distributed among the injection sites.

14.6 Alternative fertilization techniques

14.6.1 All products shall be used in accordance with manufacturers' recommendations.

14.6.2 Foliar applications, trunk injections or implants shall only be used when soil application of fertilizer is impractical or ineffective in achieving fertilization objectives. Fertilizer specified shall be formulated for the application method.

14.6.3 When applying foliar fertilizer, the fertilizer solution should be sprayed to thoroughly cover the foliage at the proper stage of growth to achieve fertilization objectives.

14.6.4 Injections and implants

14.6.4.1 Products should be applied in the root flare or as low as practical in the trunk.

14.6.4.2 Holes shall be made as small and shallow as practical.

14.6.4.3 Application intervals should be timed to optimize results with minimal negative impact.

14.6.4.4 Small-diameter trees and drought-stressed trees should not be treated with injections or implants.

14.6.4.5 If a drill is used to create injection/implant sites, then sharp bits shall be used.

14.6.4.6 Timing of injection/implant application should be at the proper growth stage to achieve fertilization objectives.

This revision draft is in a public review period during the month of November, 2002, after which it may be submitted to ANSI by Accredited Standards Committee on Tree, Shrub, and Other Woody Plant Maintenance Operations - Standard Practices, A300. Committee approval of the standard will not necessarily imply that all committee members voted for its approval.

If you wish, you can send in a comment on this standard. Directions for submitting comments:
1. Public comments must outline your objection, in detail, to a particular paragraph in the standard.
2. Public comments should provide alternative language.
3. Public comments should be accompanied by supporting material and/or illustrations where appropriate.

Two ways to send in your comments:
You can send them to any organization that belongs to the A300 committee in which you are a member. For a list of these organizations, their representatives on the committee, and their contact info go to: http://www.natlab.com/default.asp?main=content/laws/publicreview.htm and scroll down a little.

Or, send your comments directly to the A300 committee by sending them to Bob Rouse at Rouse@natlab.com or snail mail at NAA, 3 Perimeter Rd. – Unit 1, Manchester, NH 03103. Email comments are preferred.
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Winning Winter Strategies

Using the off-season to your company’s best advantage

By Jacqueline Gately

Winter comes as a mixed blessing to the tree care industry. The slowdown in business can provide a much-needed pause from the hectic pace of seasonal work. But without planning, winter can be a dull and unproductive time of year. Rather than fill the days with busywork, consider these 10 tips that use the off-season to your company’s best advantage.

1. Look ahead
Where do you want your business to be one year from now? It’s a question worth asking at a time when things are slow. The answer will provide the baseline for making projections.

Jeanne Houser, at McFarland Landscape Service in Philadelphia, Pa., looks at pricing strategies before business picks up. “We go over profitability and make sure our services, plan protection programs, and chemicals are priced right,” says Houser.

Pricing and other key metrics, like the past year’s income, expenses, customers, and injury reports, are crucial in planning the upcoming year’s course. Support progress by creating goals that are specific, measurable and realistic.

2. Tackle the wish list
Now is the time to consider in earnest whether those ideas in dog-eared TCI buck issues, newspaper clippings and notes jotted down can be put to work. Target low-cost, quick-hits that have an immediate benefit, or group several small ideas into a project. File other ideas for future consideration, then toss the rest! You can begin fillling the idea file next year with a clean slate.

Ron Keith, of Shawnee Mission Tree Service in Shawnee, Kan., looks to his 100 or so employees for feedback. “We send around a questionnaire to find out what we’ve done right and what we’ve done wrong,” says Keith. Keith and his team then strategize solutions that are put in place by January. He says the result is a team that is “renewed and ready-to-go.”

3. Give your business image a face-lift
“Business cards are often the first glimpse someone has of your company,” says Diana Ratliff, author of Business Card Basics: 121 Ways To Use Them Profitably.” While many think of a business card as a way to communicate contact information, the image it conveys is equally important, says Ratliff. Use winter downtime to rethink the impression your business card makes and revamp the design as needed.

Ratliff suggests avoiding the inkjet-printed business card on perforated paper, which can look cheap. “People are judging your professionalism by your card,” she says. She also suggests adding utility or value to a card by using the back of it, which increase the odds that the card will be kept. For example, she says, send a time-saving discount for trade show customers, or include an illustration of tree pests common to the region. Some cards even fold out, acting as a mini-brochure that replaces the often-discarded three-fold brochures. She says each design shows the customer you’re a professional willing to go the extra mile.

4. Get connected
You’ll find a wealth of arboriculture information on the Web, beginning with the National Arborist Association site (www.natlarb.com). The internet offers links to university research findings, industry news and other information that could improve your company. Why miss out because you’re not plugged in? Become Internet-savvy while business is slow.

Today’s customers are time-pressed and Internet savvy. Use the pause in business to create a Web site that acts as your online calling card. Like business cards, your Web site conveys contact information and business image. Ratliff, also a Web site makeover specialist, suggests taking the customer’s perspective when creating a Web site. “Convince people on your home page that it’s worth hanging around,” she says, “because the next Web site is only a page away.” And if you don’t have a Web site? Ratliff says you can bet there is a competitor nearby who does. But if you’re not ready to take the plunge, at minimum, establish an e-mail account that will make quick information exchanges with busy customers possible.

Planning to streamline business functions with an automated system? Roll it out in winter, when kinks can be worked out and your staff can gain hands-on experience before business is rushed.

5. Evaluate your equipment
Take a good, hard look at equipment being decommissioned for winter. Does it need repairs? Has its usefulness been outlived? Randy Owen, of Owen Tree Service, Inc., in Attica, Mich., says it’s important that every piece of equipment is dependable for the coming season to ensure a speedy response to customers. The equipment also reflects your company’s image, he says, so make it shine.

Now is the time to order new equipment, since delivery can take a while, and to give old equipment a good buff and put it up for resale.

Rusty Girouard, of Madison Tree Service, Inc., in Milford, Ohio, suggests taking inventory of small tools and supplies, as well as organizing shop areas that are quick to become disorganized during the busy season. Knowing what’s in stock, she says, allows you to anticipate upcoming needs.
6. Invest in employees
Finding good people takes time and training, so take advantage of the lull to hand-pick additions to staff. But don’t overlook your existing staff. “Any kind of management training or advancement is best to do during the off-season,” says Owen. He encourages his staff to take NAA courses and college coursework, but limits the load to one class per semester to avoid employee burnout.

Look also to opportunities for informal training. Girouard takes advantage of winter breaks to cross-train teams with basic skills such as chipping, chain sawing, and stump grinding. Come busy season, she says, “if we’re busy in one division and not in another, we can switch.”

Many industry conferences, such as TCI EXPO and Water Management Conference, are conveniently scheduled for the time when business slows. Keith suggests sending a blend of employees rather than solely managers to such events. He says each employee brings a different spin back to the team, which is shared with everyone in a debriefing session. “It motivates everybody,” he says.

7. Plan safety and other meetings
Girouard also takes the time to orchestrate the year’s safety meetings, which are held every two weeks. “We have, on occasion, people from the energy companies give talks on wires and electrical hazards; we watch NAA safety tapes and take tests; or discuss near accidents and how (they were) avoided,” says Girouard.

Vendors can be an untapped resource when it comes to training, says Houser, who recently brought her chemical vendor in to talk with her staff about efficient application. During the winter break, teams can benefit from meetings that target a specific issue or provide updates the latest products, trends and technology.

8. Reward your teams
Take time during the slow period to develop well-thought-out employee performance reviews and chart a career path with up-and-coming managers. This shows employees that you appreciate their efforts, and offers the encouragement and morale booster that just might be needed during this time of year. If there are skills you’d like to see an employee learn or a new role you envision for her, set the performance expectations now and make a plan for the year that provides opportunities for achievement.

You can also show your appreciation by throwing a company party, which is a great stress-buster that fosters team spirit and builds relationships within the company.

9. Review your files
Organizing file cabinets may seem like slow-season busywork, but it can net dollars, if you review client contracts in the process. That’s what Houser does. “We review all our sales contracts and go through our record retention requirements,” she says, looking for opportunities. Notes jotted in haste in a file might indicate a lead for added services. Look also to inactive files as an opportunity to renew relationships. Clear out any “deadwood” while you’re at it, and you’ve saved time and money by becoming more efficient.

Get a jump start on organizing receipts, running tax reports, and tallying expenses to make April 15th less stressful. Use the time to coordinate with your financial advisor on becoming a more tax-savvy business.

10. Reach out
Make your company first-to-mind with your customers by providing useful information on regional trends, tree problems and other arboriculture information in the form of a newsletter. The winter break is an ideal time to plan, assign, research and write newsletter topics for the year. Houser starts work on her newsletter in December, assigning articles and gathering photos. “Come the first week of March,” says Houser, “it’s a simple matter of mailing.” If you don’t have the resources in-house, consider hiring a professional who can pull together as many or few issues as you’d like as a marketing expense.

In addition, make personal appearances at golf courses and municipalities to introduce yourself with the goal of becoming more involved in the community. While relationships take time to establish, says Keith, start building now so you can schedule benefit events and other goings-on into your calendar.

“You’re not doing it to get the business,” says Keith, who says much of his winter season is made busy doing work for municipalities, golf courses and cemeteries. “Your doing something to help your environment and the community,” says Keith. “But in turn, it puts your name on a bid list,” which can lead to a shorter winter downtime.

Don’t aim for too brief a downtime, though. Because the slow season is a good time, as Keith puts it, “to take a breath and sharpen your pencil.”

Jacqueline Gately is a freelance writer. She can be reached at jgately@magwriter.org
Accident Causation: Human Factors & Cultural Change

By Paul Elcoat

It has been found that concentration on the development of a safety culture within a company increases the professionalism of staff in every other aspect of the business. Honest assessment of any problems embedded within a company and a single-minded pursuit of cultural improvement has enabled me to significantly reduce work-related accidents and illness and to successfully market the company at the highest levels.

There tends to be three common areas of influence when looking into the causes of industrial accidents, and these factors usually operate in a complex and interactive way. Careful analysis of the potential for failure in each area is an excellent aid in the development of a safety culture and ultimately to the reduction of accidents in the workplace.

The areas that determine the way people behave while at work are organization, job and personal factors.

Organization

Organization includes such things as management commitment, management control and the general safety climate. To a large extent, the development of a positive safety culture or the improvement of an existing unsafe culture is in the hands of upper management and supervisors. The following C’s describe the steps to be

Further advice on the creation of a safety culture can be found in the Health and Safety Executive publications, “Reducing error and influencing behaviour (HSG48)” and “Managing health and safety (HSG65),” available from HSE books (www.hsedirect.com).
taken when focusing on the organization:

- **Commitment:** Management must be committed to the concept of a safe culture and this commitment must be made known and demonstrated. Supervisors must lead by example.

- **Competence:** Management and supervisors must be totally familiar with arboricultural standards of best practice and the competency requirements for the operations they intend their staff to undertake. Appropriate training must be given to staff and a system for advice and support should be made available either by employing a highly competent technician or by an arrangement with an external consultant.

- **Communication:** Verbal, written and visible communication must be present in all directions. Endeavor to remove all barriers and encourage open, honest and constructive communication by adopting a "no blame" system. In a "no blame" society, employees will accept responsibility for their mistakes. Always consider the net results of your actions and contrast the outcomes of the alternatives when handling a situation.

- **Cooperation:** This needs to exist between individuals and groups. Involve staff in decisions relating to change.

- **Control:** Give individuals clear responsibilities and set well-defined performance standards based upon excellence rather than productivity.

The job: Ergonomics

Ergonomics is the study of the interaction between workers and their work. It is concerned with the design of the workplace, work equipment and work methods. Inclusion of ergonomic factors when planning systems of work requires that a manager consider the needs and limitations of the operator in terms of physical and mental capabilities and the individual's expectations.

Ergonomics is about ensuring a good fit between people and the things that they use. It is probably easy for each of us to remember a time when the climbing harness dug into our hip under the weight of the chain saw suspended from it. A thinking climber might cure this ergonomic problem by supporting the chain saw from a separate tool line. Consider one log processing machine where the positions of the operating handle and the foot pedal required an operator to have a left leg that was 2 meters (6 feet) long!

If a company were to examine the circumstances surrounding incidents and near misses in the workplace, it may find that the operator is subject to the following inadequacies:

- Unable to reach controls;
- Unable to see important displays;
- Overloaded with too much infor-
mation at one time;
- Inattentive because there is too little to do;
- Unable to work in a comfortable position.

The people who actually do the job are usually the best people to identify the most comfortable way to perform a task, so the underlying message is clear: let the climber choose his or her own harness, for example. I have found that approving three or four models of harness gives company climbers sufficient choice, and encourages trainee climbers to try several types during their training. It pays to remember that when employing a seasoned climber, she may have become used to poor design over time and could be reluctant to give up the horrible sit belt that she has been using for the past 20 years.

Unsuitable physical working conditions can affect people's attitudes and undermine any attempt to develop a safety culture. The physical stresses imposed by poor and uncomfortable working conditions will also reduce an employee's ability to work effectively and think clearly.

The following statement might sound obvious, but needs to be adhered to at all times: a well-trained, well-equipped and comfortable arborist will be safe and efficient.

Personal factors: The individual

In asking the question, "How can a manager encourage staff to want to work safely?," I feel that investigating why people work in an unsafe manner would be useful. In the no-blame culture of my company, staff openly discussed that unsafe work practice is due mostly to:
- Taking the path of least effort;
- Complacency;
- Macho attitudes;
- Impractical safety rules;
- Finish work more quickly, especially at the end of a job;
- Thinking that management does not care how the work is done, as long as it is done quickly.

The truth hurts, but it does give us something to work with.

The different habits, attitudes, skills, personalities, knowledge, and physical and mental capabilities of individual employees will change from time to time in response to various factors such as:
- Age and physical condition;
- Stress;
- Motivation and job satisfaction;
- Home life;
- Ambition and job security;
- Leadership by example.

Motivation is the driving force behind the way a person acts in order to achieve a goal. A person could be
motivated positively to wear chain saw protective equipment by being advised of the benefits by an effective manager or by having had an accident in the past. Attitude is the way a person tends to behave in a particular way in a certain situation. It is based upon how the person thinks and his or her beliefs and assumptions. These beliefs and assumptions could be affected by background information, culture, peer group pressure and experience.

A person’s attitude toward wearing chain saw protective equipment might therefore be shaped by the behavior of others or by the individual’s lack of confidence in the company’s ability to manage health and safety in general. As a manager or supervisor, it is important to be aware of how staff members perceive what is said or the example that is set. Perception is the way a person views and understands a situation, depending upon his or her knowledge and past experience. One person may perceive a situation as dangerous because he is unfamiliar with it, whereas another person may have become complacent about the fact that she works close to live electrical equipment every day and therefore perceives the risk to be low.

Behavior is the outward communication of attitude, and learning can be defined as a permanent change of behavior. All staff members must learn that safety is the first and most important consideration. All planning must be safety-first, and if that makes your company more expensive than the other company offering a quote, then so be it – let the other company have the job. In the long term you will win a better class of work for a better class of client and obviously that will lead to your company to attract a better class of employee.

Conclusion

As a warning to the manager who embarks upon the quest for a safety culture and total professionalism, you will undoubtedly meet resistance, as changes to the accepted norms are fundamental to success. Often people who are key employees in a company will be the cause of the most opposition. There will be “casualties” during the trip to a safer culture, but remember that the company is more important than any one person.

Above all, stick to what you believe to be right, and in one year, you will be justifiably proud of what you have created.

Paul Elcoat is the Head of Arboriculture for Salcey Arborcare based in Northampton, UK. The company employs 50 arborists working in the domestic, commercial and rail infrastructure vegetation management environments. Paul can be contacted at paulelcoat@yahoo.co.uk and would be keen to hear about the experience of other managers.
Before the Civil War, Winslow Homer painted a croquet game under two large copper beech trees on a lawn in Belmont, Mass. Today, the painting hangs in a Chicago Museum, and those same two beech trees still hold court on that same lawn 150 years later. Why do certain trees live for centuries?

I recall other old trees, as well: An alley of gigantic, centuries-old plane trees lining a half mile road to Chenonceaux Castle, a residence of kings of France; a perfectly spaced row of pollarded plane trees, exactly 15 feet apart, planted 200 years ago in Villanueva, France—a town first settled by the ancient Romans. Not one tree has died.

On the Boston Common there are two spare English elms, reputedly planted by Gov. John Hancock of American Revolution fame, whose farm was across the street. (As with all politicians, he got the city to pay for the planting.) Along the Charles River near Harvard University, Memorial Drive is shaded by a cathedral canopy of old buttonwood trees, though repeated street, sewer and river renovation has compromised the health of those on one side of the street.

The fascination with these and similar old trees is simply, “Why have they survived so long when the average life span of a tree is close to 40 years?” According to the people whose job is to care for these ancient specimens, four factors seem important:

1. Genetic makeup. Some species are long lived, others are not.

2. Reliable underground water source. At Chenonceaux, ancient trees grow along deep drainage ditches. The Romans always chose sites with pure spring water, one of which happens to run right next to the row of old trees in Villanueva. The trees on Memorial Drive send their long thirsty roots into the adjacent Charles River. And Winslow Homer’s beeches tap an underground water course.

3. Weather. Old trees are very heavy and subject to wind damage. Droughts take their toll. Pruning and cabling can help reduce the chance of branch splitting. A deep watering once a month (let the sprinkler run overnight) during periods of low rainfall helps.

4. Human neglect. Ancient trees were not abused by man nor beast. Farming, foraging and wildlife were the main hazards of the past. Construction damage, vandalism and a change in the root environment are the main risks today.

Perhaps one reason Winslow Homer’s beeches have thrived is because no one mucked around with them over the years. They were left alone to grow naturally and slowly in the historic district. Their root system was protected from construction, herbicides, new sod and the ministrations of grass perfectionists. No fancy landscape pruning or repeated fertilizing was done—just some pruning for structure and cabling.

Keeping old trees growing for another century requires understanding what care they need, as well as what not to do. Old trees grow very slowly, just enough to survive.

Dennis Collins, curator of the plant collection at Mount Auburn Cemetery (an arboretum first planted in 1831) says that in most cases, “a tree can grow indefinitely. Then some change in its environment—such as storms, climate, pathogens, soil chemistry, construction or grass under the dripline—will stress the tree. Often it’s a combination of stresses.”

When trees are abused or seriously stressed, they decline and eventually die. However, they die very slowly. So identifying the cause usually means thinking back to what happened several years before. For instance, was a new driveway installed, or curbs, or sewers? Was sod put on top, herbicides, too much fertilizer or a new sprinkler system?

How to recognize decline

Look to the leaves (and the branches) small and large. If significant thinning occurs, worry. If leaves color too early in fall, if small branches die back all over, if winter dieback seems too severe, think about decline.

If huge branches and huge chunks brown and die, think about advanced decline. Try to catch decline very early and try to improve health.

Old trees are like old people. They are fragile, but with gentle
care, they can survive. Some people are lucky and inherit old trees – perhaps not as famous as Winslow Homer’s, but cherished nonetheless. The challenge is to make caring for them cost effective for one’s customers.

What’s the latest thinking on mature tree care?

It’s back to some old basics. At Harvard’s Arnold Arboretum, they are testing the soil pH to a depth of 18 to 24 inches and finding it’s more acidic (pH 5) than most trees prefer, especially their old beeches. They are using dolomite lime to raise the pH under species that prefer it closer to pH 6.

Healthy soil is a live, microbiotic soup of tiny organisms that are necessary to facilitate the uptake of nutrients. Soil needs a pH that allows essential chemicals to be in solution and organic material to nourish the creatures in the soup. Mulching is basic to improving the soil, and increases the number of these anonymous organisms. The best mulch is well-rotted wood chips. How long is well-rotted? About nine months to a year, depending on the time of year (faster in warm climates), but beware of incomplete decomposition.

Thomas Ward of the Arnold Arboretum says that after a year under mulch, the soil become full of earthworms, which in turn deposit their castings, the ultimate organic, to enrich the soil. Another observation at the Arboretum is that given optimal growing conditions, some trees grow too fast, and may not allocate their resources well. Perhaps they use up their life span too soon. (This category might include trees such as an 80-year-old sugar maple – 18 inches diameter, 70 feet high.) How will these trees tolerate the past 20 years of recurrent drought, and especially the recent very high temperatures in some parts of North America?

What is the documented oldest tree in the Arboretum, founded in 1872? Actually it is a 1737 Chamaecyparis obtusa in their bonsai collection. It grows very slowly and is constantly pruned and pampered. In Europe, pollarded trees live for centuries. Currently there is re-thinking about whether to reduce large trees and by how much. This is a heated debate still in progress. [See TCI September 2002, “Structural Pruning of Large Shade Trees.”]

Beech trees, a case history

About a decade ago, many old beeches at Mount Auburn Cemetery were in serious decline, so a program to improve the trees’ health was started. Turf was removed from under the dripline and an organic supplement (emulsified seaweed) was added, topped with wood-chip mulch. A monitored water program was sustained during dry periods. Their health and vigor improved, slowly.

One special beech, important because it was planted by the Prince of Wales in 1860, suffered from badly compacted soil. In this case, thin radial trenches, 24 inches deep and filled with stone, were also added (in addition to all the above-mentioned care).

“It’s improved, but not yet out of the woods, yet,” says Collins. In his opinion, the worst thing under an old tree is turf. It competes with the roots in every way possible. The best thing for any tree is the largest possible area of mulch. And the most important thing for preserving old trees is regular deep watering during dry periods.

Insects and disease

When any biologic population becomes large enough and concentrated enough, it provides a highway of infection over which a pathogen can run rampant.

We have seen American chestnuts eliminated. Dutch elm disease has spread across the continent. Dead pines have spread to the fecocity of western forest fires. Eastern hemlocks are being decimated by a tiny Japanese adelgid. California oaks and other western trees are currently threatened with a pathogen for which we have no cure. Macro-environmental events such as these are unfortunately beyond any one person’s control. The best that arborists can do is fight holding actions at...
the onset until the crisis passes or long-term solutions are perfected.

Care of old trees

1. Be conservative. Don’t change the habitat in which the tree has been doing well.

2. Don’t change the root environment under a happy tree. Roots spread two or three times as wide as the drip line and they require mycorrhizae, microbes, good fungi, and other microscopic organisms to thrive. Grass inhibits and competes with these. But please keep mulch no deeper than 2 to 4 inches. Dig down and check on the depth. It need not be added to each year. Just rake lightly and top dress with a sprinkle of new mulch for neat appearance. Mulch can also be refreshed up with a water-based spray paint from Amway. (I kid you not.)

Fallen leaves left in place will self compost. Non-vigorous ground covers such as lamiustrum “Golden Archangel” are OK, but don’t use vigorous ones such as ivy or euonymus. To improve the design, make a perfect circle or an esthetically pleasing shape under the tree, and add a bench or a statue if you want.

3. Don’t bury the roots with fill, even good loam, deeper than 3 inches. Six inches over a beech or sugar maple will kill them.

4. During droughts, soak the roots deeply for at least 12 hours. It may take several days to cover the whole root run of a large tree. If each soaking is adequate, it is usually necessary only once a month. A new sprinkler can disrupt the existing metabolism and may rot the roots. Near the edge of the leaf canopy, new roots will eventually find the new water and the tree will gradually adjust.

5. Don’t push fertilizer and force an old tree to grow faster. One wants to keep it alive, not make it bigger. Ideally, use organic. Standard advice is no more than every three to five years, and then sparingly. Top dressing is just as effective as punching holes. And be wary of herbicides over the root run, especially beech and locust.

6. Treat only problems that are important and threaten the trees health. All have a few bugs, a little fungus, branches that break, and such. These don’t necessarily have to be completely cured, just kept under control.

7. Large trees can lose a small portion of their root run for necessary construction. However, large major roots should be excavated, not cut, and pipes can be pushed underneath them.

8. Unfortunately, hurricanes and high winds are the main killers of old trees. Preventative pruning helps a lot. Pruning should remove dead or dangerous branches, keep the tree well balanced and the leaves thinned so high winds will blow right through.

Such structural pruning for strength and balance is important, but don’t overprune. The upper bark shouldn’t be suddenly exposed to sunlight. Certain old trees, particularly beech, oak, sugar maple and even kousa dogwood, will die back and can be killed by sunburn on the high branches and trunk.

Cables are also often needed to help balance the tree and keep heavy branches from splitting off. Decay frequently begins at the crotches, so cable as high as possible to help the most. Interestingly, Mount Auburn Cemetery’s Japanese maples have done quite well. They have the state champion, planted in 1910 (24 inches diameter, 50 feet tall), however it grows in a protected hollow, sheltered from hurricane force winds.
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What Caused That Hole?

Bird and insect damage to trees

By Cherlyn Kern

Spike damage to a pine. Photo courtesy Cherlyn Kern.

Green ash filled with borer holes. Photo courtesy Dr. Bonnie Appleton.

Sap or resin may plug holes. The plugs come to resemble popcorn on some trees. Photo courtesy Cherlyn Kern.
There was a time when small holes in trees were as likely to be caused by spike damage as by birds. Thankfully, those days are gone, and spikes are usually worn only for removals. The cause of larger tree holes, whether created by lightning strikes, equipment wounding, or breaking or pruning branches, is usually obvious. But the causes of holes that are smaller than 1 inch across are often more mysterious and problematic. Birds and insects are the primary biotic or living causes of the smaller holes, which may be round, rectangular, slit-like or D-shaped.

Woodpecker holes
(Picidae family)

Damage from sapsuckers (a species of woodpeckers) is common. Most of us are familiar with their “chirping” sound and the rat-a-tat-tat as their beaks rhythmically pound in and out of tree bark. The yellow-bellied sapsucker, the red-breasted sapsucker, and the Williamson sapsucker, a western species, drill a rectangular array of parallel holes about one-quarter inch in diameter. They eat the sap that oozes out of the holes, the ants that are attracted to the sap, and the beetle adults and larvae that may lie beneath the bark. Although the holes are unsightly, damage is relatively minor unless whole pieces of bark slough off. If the holes girdle the cambium beneath the bark, then the portion of tree above the damage may die.

Woodpeckers generally bore deadwood, but sapsuckers drill live wood. Some flickers, another species of woodpecker, drum against dead trees because the sound produced more readily attracts mates than the muffled sound produced when drilling into live trees. The birds also “listen” periodically for sounds of bark beetles or beetle larvae boring tunnels inside the tree and drill diligently to find the larvae.

Woodpecker holes, over time, may widen into larger holes from repeated visits or if they are excavated as nesting holes.
The piliated woodpecker, red-bellied woodpecker, downy woodpecker, red-cockaded woodpecker and golden-fronted woodpecker all eat wood-boring larvae of beetles. The red-headed woodpecker prefers flying insects and ground beetles but will occasionally drill holes in dead trees for wood-boring larvae. Contrary to its name, the ant-eating woodpecker, a Midwestern and Western species, eats fewer ants than other woodpeckers and eats even fewer wood-boring beetle larvae.

Educate your clients to keep an eye out for woodpeckers. They are your first line of defense to determine whether sapsuckers or woodpeckers are causing damage. Sapsuckers, not woodpeckers, are the culprits that damage trees; however, woodpeckers can pinpoint boring insect damage and the extent of damage. Usually, woodpeckers excavate in a vertical direction as opposed to the horizontal bands of rectangular or round holes associated with sapsuckers.

Migrating sapsuckers may feed on a favorite tree for several years. Loss of habitat has already contributed to a decline in the sapsucker population. Wrapping bark of susceptible trees with burlap during sapsucker migrations is a benign way to control sapsucker damage. Smearing a sticky repellent on the tree may also deter woodpeckers, but the main preventative measure is maintaining a healthy and vigorous tree that is less likely to be attacked by bark beetles and wood borers.

**Wood-boring beetle holes**

Since bark beetles and wood borers attack trees weakened through stress, decline or infestation, maintenance of tree health is essential. If beetles have already attacked by the time a client calls, the damage—which may also include a secondary fungal disease—is usually too extensive to fix.

Try to educate your crews on what to look for, so they can spot problems early as they work on a property. The first sign is usually tiny pinhead-sized holes in the bark. If they gently pry off some of the surrounding bark, they will see the cambium laced with tiny tunnels or galleries, indicating that beetle larvae have tunneled their way to the outside as they matured. Unfortunately, damage is already done by the time most homeowners see the holes, and arborists may be able to do little other than remove the tree.

Wood-boring beetles include round-headed or metallic woodborers, characterized by long-horned adults (Cerambycidae family), flat-headed woodborers (Buprestidae family), bark beetles (Scolytidae family), and ambrosia beetles (Scolytidae and Platypodidae families), a type of bark beetle. Many adult beetles burrow through the bark and into the sapwood, filling their entrance with chewed wood and debris called “frass.” (Woodpeckers do not produce frass.) Sometimes sap or resin resembling popcorn plugs the holes or may wet and discolor the bark beneath the opening. Beetle larvae either chew tunnels in the cambium or stay under the bark without leaving exit holes; however, frass may be visible in bark crevices.

Bark beetles live and feed just beneath the bark, but ambrosia beetles, also known as pineworms, may tunnel into the heartwood, leaving a black stain that is actually
associated with an ambrosia-like fungus (hence their name). Ambrosia beetles prefer moist wood, including live trees. For evidence of ambrosia beetles, look for numerous toothpick-sized sticks of frass extending up to 1 inch beyond the bark. Pencil-sized holes appear when the sticks are broken off.

Some woodboring beetles vector the pine wood nematode that can kill the trees, primarily pine species, within three months. Pine bark beetles are particularly aggressive in yellow pine (Pinus ponderosa), eastern white pine (Pinus strobus), spruce (Picea spp.), and loblolly (Pinus taeda). A new threat that has been detected in New York and Illinois, the Asian longhorned beetle or starry sky beetle (Anoplophora glabripennis), prefers maple (Acer spp.), in which the emerging adults create round exit holes, 3/8 inch or larger in diameter.

Preventative measures that preserve healthy trees are the best controls for woodboring beetles because they target wounded and stressed trees. Such measures include pruning and removing deadwood, including stumps, proper fertilization and watering, and proper tree selection and location. Sometimes a spray or injection regimen may be recommended.

Holes made by other insects

Holes from some insects, such as bees and wasps, indicate there may be a tree problem. These insects do not cause hole damage, but merely occupy existing holes, since entry is readily available. Large carpenter bees (Xylocopa spp.), however, bore holes for raising their young in softwooded trees such as cedar (Cedrus spp.), white pine (Pinus strobus), poplar (Populus spp.), or redwoods (Sequoia sempervirens). Their holes average 3/8 inch to 3/4 inch in diameter but their tunnels may extend up to 10 feet, often turning 90 degrees within the first 1 or 2 inches. Usually there’s an exit hole somewhere. Carpenter bees bore mostly dead, treated or seasoned wood, but may bore through live wood also, primarily in a decayed section that is no longer chemically defensive. Although carpenter bees don’t eat wood, they will chew wood to make tunnels and may regurgitate the wood and other debris at the tunnel entrance, leaving unsightly stains beneath the hole.

Carpenter ants, Camponotus spp., don’t eat wood but will nest in decayed hollows excavated in primarily moist wood, including live trees. Ants enter and leave tunnels through natural openings such as knot-holes, insect tunnels, decayed sections or wounds. The ants deposit coarse frass near the openings as they clean the galleries that may extend into healthy heartwood. Sometimes the ants cut slits through which to exit. When the slits are no longer used, they become “windows” that are sealed with a clear substance. Carpenter ants don’t directly weaken a tree, so control measures usually aren’t needed except to further remove the ants from homes and buildings.

Termites eat wood and leave “dirty” galleries, as opposed to the clean ones excavated by carpenter ants. Also, many termites, such as the subterranean Formosan termites, sometimes infest live trees, but there are few external signs beyond occasional dirt or frass tubes appearing on the trunk near the base of a tree.

So, what do you do now that you have discovered holes in a tree and determined the cause? Once invasive insects and woodpeckers leave, the tree will naturally close its wounds unless damage is extensive. Don’t fill the holes with concrete or tar as these materials may inhibit wound closure and can seal in moisture, creating an environment conducive to pathogen build-up and decay. Digging out the decay also contributes to tree damage and rot and is not advisable.

Abiotic (Nonliving) Causes of Hole Damage

- Tree-climbing spikes
- Hall on wind-driven side
- Nails
- Vandalism, including carving
- Mechanical parts from trimmers and lawn mowers
- Diagnostic arborist tools such as increment-borers to determine a tree’s age and injection equipment for systemic application of chemicals and fertilizers.
Fungi are fundamental to the success and health of almost every ecosystem on earth, both terrestrial and aquatic, and essential to the sustainability of biodiversity. However, how often do we consider their existence within a habitat, let alone how conditions could be improved by active encouragement and management of fungal diversity?

Fungi are perhaps the most unappreciated, undervalued and unexplained organisms on earth. When you ask someone to describe a fungus, you will get a variety of descriptions ranging from moldy bread and mildew on the bathroom wall to magic mushrooms and poisonous toadstools. Some enlightened individuals will tell you that fungi are essential for things such as breadmaking, brewing, and medicines. However, these are only some of the more visible supporting roles that fungi play. Rarely considered, even in general scientific circles, is that there are many times more fungi than plants on earth, and that each type plays a crucial role in the processes supporting the functioning of major ecosystems.

Fungi are present almost everywhere, in a spectacular array of shapes, sizes and colors, and perform a wide variety of different activities. In 1991 David Hawksworth, a mycologist at the Royal

Oak polypore (*Pihtoporus quercinus*) photographed in July fruiting on exposed oak heartwood of a standing living tree in Windsor Forest, its principal UK stronghold. The fruiting bodies are very reminiscent of the birch polypore (*Pihtoporus betulinus*) in both shape and texture. The color of the upper surface has been described as similar to cream caramel, but darkening with age. They can appear on trees in July and August from just above ground level to a height of 12 meters; on fallen trees; in crevices between root buttresses; as well as inside hollow trees. All the fruiting bodies have been found on oak (*Quercus robur*) on deadwood of either a dead or living tree; as individual brackets; in layered tiers; or in clusters. Photo by Martyn Ainsworth.

*Ramaria stricta*. This is an uncommon fungus normally found on or near stumps of conifers and broadleaf trees in late summer to winter. Seen here growing on a woodchip mulch spread across a garden flowerbed, the dense mass of white mycelium can clearly be seen as a system of cords foraging for resources within the mulch. Photo by Andrew Cowan.
Botanical Gardens at Kew in the UK, estimated the world’s fungal diversity at 1.5 million species (equal to the estimated number of all known other living organisms). This was thought at the time to be a radical overestimate, but now other researchers have proposed figures in excess of 13 million.

Fungi perform essential roles in every terrestrial, and many aquatic, ecosystems, eg. decomposing dead organic matter to release nutrients, supporting plant life on poor soils by improving the absorption of nutrients when they form mycorrhizal associations with roots, living inside plants as endophytes, and forming symbiotic partnerships with algae to form lichens. Any deterioration in fungal populations and diversity can therefore have a considerable impact on ecosystem health; in fact, the loss of lichens from an area is often used as an indication of poor air quality.

What fungi are and how they live provides some insight into the reasons for their significant role in ecosystems. The basic structures of most fungi are microscopic threads called hyphae, which form the active feeding and growing body of the fungus. The majority of the world’s fungi are microscopic, and they do not usually produce structures that are visible to the naked eye unless the hyphae form a thick growth (often referred to as “molds”). However, the most familiar species are those that produce spore-bearing fruit bodies, which are clearly visible to the naked eye. These include puffballs, coral fungi, earthstars, truffles and other forms of mushrooms and toadstools. These are the so-called larger fungi, or macrofungi.

Some fungi are very adaptable. For example, species of leaf litter decomposers such as the parasol mushrooms (Macrolepiota species) and funnel caps (Citrinopilea species) decompose organic matter indiscriminately regardless of source, while others, such as the Ear Pick fungus (Auriscalpium vulgare) (found only on pine cones) are far more specific and occupy a very restricted niche. There are others that are so geographically and biologically restricted they are considered rare and are now included on endangered species lists. Some fungi are known to have rapidly declined due to pollution and loss of habitat.

**Decomposition and nutrient recycling**

One particularly crucial role of fungi is in the transport, storage, release and recycling of nutrients. Nutrient cycling – the continuous supply, capture, replenishment and distribution of carbon, nitrogen and minerals – is fundamental for the ongoing health and vitality of all ecosystems. In woodland ecosystems, a substantial proportion of the nutrients stored, or in various states of flux, is in living and dead organisms, both above-ground and in the soil. Fungi, microbes and fauna may account for much of this nutrient resource in soil, and these organisms work together in a soil-based food web to recycle the nutrients. They expedite crucial transfers and transformations of nutrients within micro habitats, including transfer from leaf litter, twigs, branches and logs into soil, and from soil into plants. As a result, soil organic matter and nutrient availability to plants is entirely dependent on the activity of soil organisms such as fungi.

The ability of fungi to decompose major plant components – particularly lignin and cellulose – is the basis of their organic recycling role. Without decomposer fungi, we would soon be buried in litter and debris. They are particularly important in litter decomposition, nutrient cycling and energy flows in woody ecosystems, and are dominant carbon and organic nutrient recyclers of forest debris.

Fungi are particularly valuable in acidic soils, where the low pH makes it difficult for the survival of other organic decomposers such as bacteria. Bacteria release nitrogen in the form of nitrate, which is easily leached from the soil and therefore lost to surface roots. However, the fungi that break down the organic surface litter release nitrogen into the soil in a form of ammonium nitrate that is less mobile. This could be very important to the successful establishment of young trees and to the sustainability of the ecosystem as a whole.

**Mycorrhizae – “fungus-root”**

The transformation of nutrients and their transition from soil into plants is an essential component of ecosystem nutrient cycling that could not be achieved
without the fungi. Mycorrhizal associations form fungus-root systems that are far superior to roots alone. Many of the world’s plants are partnered by mycorrhizal fungi, both in natural ecosystems and in agricultural or forestry crops. The fungi have a mutually beneficial relationship with the plants, thanks to a two-way exchange that occurs in modified roots known as mycorrhizae (literally, “fungus-roots”).

Carbohydrates from the plant are transferred to the fungus, while soil nutrients such as phosphorus are transported from the fungus to the plant. Mycorrhizal fungi are central to the processes of nutrient capture and recycling for most higher plants in low-nutrient soils, as they assist in the acquisition of scarce nutrients and improve their absorption by the plant. Networks of fungal hyphae radiate outward into the soil from mycorrhizal roots, forming a vast mycelial infrastructure capable of absorbing soil nutrients far more efficiently than plant roots alone.

The fungi act as an extension of the root system, resulting in improved nutrient uptake for the plant. This is particularly important for soil-immobile nutrients such as phosphorus. In woodland soils, where plants compete for available nutrients that may be in short supply, this association can provide a vital support system to help maintain the stability of the ecosystem.

Mycorrhizae are grouped into two main types: Ectomycorrhizae occur predominantly in association with woody plants, including many of the world’s major forest trees. The fungus forms a sheath around the fine roots of plants, penetrating between the outer cells and forming a Hartig net. A diverse range of fungi form ectomycorrhizae, and most of these produce large fruit bodies. The second type, endomycorrhizae, do not have a sheath, but the hyphae penetrate both inside and between the plant root cells. Fewer species of fungus form endomycorrhizae than ectomycorrhizae, and endomycorrhizal fungi do not generally produce large fruit bodies.

Among trees, mycorrhizae are a major part of the strategy for capturing, taking up and recycling scarce nutrients, and well over 1,000 species of mycorrhizal fungi may be associated with them. Living and dead fungi, microbes and fauna may account for much of the soil nutrient resource in forests and woodlands. Mycorrhizal fungi may also buffer plants against environmental stresses such as disease (for example by protecting plants against pathogens) by increasing host vigor, and by acting as barriers, actively competing against the intruders.

The fungus inside — Endophytes

Still unknown and unexplained, the unseen world of fungi living inside plants as an inconspicuous embroidery of threadlike filaments provides yet another dimension to the fungal support system. Plants are not just single organisms; they are entire symbiotic systems. Virtually every plant species that researchers have examined has fungal endophytes, including several fossil plants related to club mosses. We have not even begun to understand the complexities of their relationships. Some are thought to help with the storage and distribution of nutrients and carbohydrates around the plant, while others are pathogens waiting for the time to strike when the conditions are right. Some may act to defend the plant by producing toxins that make the plant distasteful to herbivores.

This fungal world within plant leaves, stems and roots, went largely unappreciated until 1977, when researchers found a grass endophyte to be responsible for many livestock poisonings in cattle and horses that eat its host; a tall fescue grass. Research in Europe has found 40 to 70 species of endophyte in 11 different trees and a further 400 associated with grasses.

Endophytes have been found to play a crucial role in the production of extremely beneficial chemical compounds. For example, the cancer-fighting compound taxol, which was originally derived from the Pacific yew, has been found to be a product of endophytic fungi. Some of the most recent research,
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reported in the *New Scientist* in April 2000, found not only that multiple endophytes in various yew species produced taxol, but that other fungi in wholly unrelated plants do so, too. Since taxol has antifungal properties, particularly against “water moulds” (not true fungi), it may help keep pathogens at bay and strengthen the plant’s defence system. However, a lot more research is needed, as taxol may not be the most effective of organic compounds. The potential for finding something far better and much more effective cannot and should not be overlooked.

**What now?**

Despite their central role in ecosystems and their applications in biotechnology, knowledge about fungi remains at a low level. For example, it has been estimated that only 5 percent of the world’s fungi have so far been discovered, and for most of these, little is known about their biology. If we don’t know what they are, how do we know what they do, and what capabilities could we be harnessing? Our lack of knowledge may relate to the inconspicuous nature of many fungi. Most are rarely seen, and those producing conspicuous structures appear fleetingly, at unpredictable and irregular intervals.

The masses of fungal hyphae that spread throughout the soil and into the plants themselves are responsible for keeping the entire ecosystem in healthy order. In the deep layers of organic litter found on the surface of woodland soils, the decomposer fungi and those associated with roots as mycorrhizae form an interlocking web of mycelium that binds this organic horizon together.

Organisms killed by pathogens contribute organic matter for nutrient cycling. Fungal pathogens of trees produce gaps, contributing to natural ecosystem dynamics and creating cavities in trunks and hollow logs that are used by native animals, and accelerating the return of woody organic matter to the soil. Furthermore, some pathogenic fungi are used as biocontrol agents — a good alternative to chemicals for controlling weeds and pests.

Fungi need a constant supply of organic matter to survive and thrive. The nutrient cycle relies on the reintroduction of dead material to provide a constant source for the fungi to decompose. In an existing woodland, the organic horizon is topped up each year with falling leaves, but in our parks and gardens, or on new planting schemes, this source of nutrients is either non-existent or is removed as over-enthusiastic gardeners remove all the autumn leaves. In these situations, the application of an organic mulch becomes very important and will improve the quality and productivity of the soil.

The recognition of fungi in ecosystem restoration and conservation is long overdue, and accelerated studies on fungi are now needed, not only so that we may learn to harness more of them in more ways, but also to gain a better understanding of how ecosystems operate. Perhaps most important, we need to learn how to lessen human impact on ecosystems and to implement more efficient rehabilitation regimes on degraded land.

Andrew Cowan is the owner of Tree Craft, Ltd. in Westerham, United Kingdom.
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continued on page 120
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ICO 2003
February 4-9
So ... You Want a Web Site ... 

Part II
By Diana Cardillo

"O.K., I’m ready for a Web site ... Now what?
How you handle the design and implementation of your Web site is your next decision. Are you going to “do it yourself” or hire an “expert”?

A tempting and often initially inexpensive option that some business owners take is having that “second cousin once removed who’s good with computers” build the site. More often than not, this becomes an expensive alternative with unsatisfactory results, and one fewer “cousin” in the family.

A competent Web production company is adept in the craft of Web design, and may be a more favorable alternative.

Many hosting companies offer online wizards and standard page templates to develop your Web site, and may be a more cost-effective alternative.

The following serves as a “guide” for those of you who cannot only wield a chainsaw at amazing heights and climb a tree faster than a polecat, but are computer savvy and can handle the design and implementation of a Web site.

Six Basic Steps...

1. Be a Web User

A good way to develop an effective Web site is to be an active Web user. Most of the information needed to create, develop, publish and maintain a Web site actually lies within the Internet.

Start by taking time to visit as many sites as you can both inside and outside the green industry. Visit both vendor and competitor sites.

As you visit other green industry sites, ask yourself:

- Is it clear what this company does?
- Do these people know who their customers are?
- Is the overall page layout pleasing to the eye, easy to read and navigate, or is it busy and confusing?
- Do they make it easy for customers to navigate the site and find useful information?
- Have they made it easy for people to contact them or ask questions? How can you contact them? Are e-mail addresses and phone numbers easy to locate?
- Do they waste their visitors’ time with lots of pretty graphics that take a long time to load, and not enough text?
- Are they providing useful information about their services and the industry?
- Would you visit this site again?

2. Hosts and Name Registration

A host company provides the service of making your Web site available on the Internet. Hosts can be a local computer firm, telephone or cable service provider, Internet domain name registrar or Web hosting firm. A little research on the Web can help you identify the right host for your site.

A domain name is your address on the Web. Consider the length of the name and its relevancy to your company name. Ideally it should be YourCompany.com. Before registering your name, find out if it is available by using a search in the WhoIs database on the InterNic at www.internic.com. There are literally hundreds of companies who can register your domain name, so check out several registrars and the services they provide. You can also obtain a list of accredited registrars from the InterNic.

3. Basics of site design

A good Web site is the result of hard work and a combination of art and science. Effective Web sites combine a clear purpose, thoughtful organization, substantive content, clear and sharp graphics, and ease of navigation.

Your Web site will be viewed not only by your customers and prospects, but also by suppliers, potential employees, competitors, loan and lease officers, and others. Identify your most important audience (your customers and prospects) and focus your message on them.

a. Overall Design

Develop an overall diagram of your Web site layout. This can be drafted on paper, and should include how the pages link to one another. For example, your Web layout may include the following six pages: Main (Home), Services Provided, Company Profile, Recent Projects, Feedback or Information Request form, and a "Contact Us" page listing your business address, e-mail address and phone numbers. All of the pages link directly to and from to the Main (Home) page.

b. Content

Content is the “meat and potatoes” of your Web site. At first the task of developing content may be daunting, however, you can gather content from your existing company brochures and marketing materials.

Provide information that is clear and interesting to your visitors. Provide links only to relevant sites outside your site (such as the National Arborist Association, Cooperative Extension, etc.).

c. Graphics

Gather existing and/or create simple
reusable graphics that are relevant to your site. Simple does not mean not fancy or not appealing; it means small file sizes in a standard file format such as gif or jpg. Browsers store graphics in cache on the user's computer which saves loading time, so you'll want to reuse your graphics. Consider using royalty free clip-art, digital photographs of your crews at work, company and member association logos.

d. Layout.
Design a standard page layout for your site. Internet users like sites where they can figure out where to go quickly and easily. Give each page a consistent background and set of navigation links or icons. Site navigation can be as simple as text hyperlinks or as complicated as fancy graphics.

e. Home page
Design your home page with content that loads quickly and informs the visitor what the site is all about, including a brief introduction of your company and services. Your home page should not provide background information such as your company's history or a company "Who's Who" listing. This information belongs on another page.

Include details like your company's phone number and mailing or e-mail address somewhere on the page.

Display a sharp logo, graphic and/or other caption at the top that invites the reader to stay and conveys what your business is. Although you may be very proud of a recent project on a 200-year-old oak, do not display a digital photograph of it as your home page with an "Enter Here" button. Users won't stick around to learn more — would you?

4. Test your site
View your site in several different browsers and at different screen resolutions. Not all users use AOL to access the Internet; many use Netscape; others use Microsoft's Internet Explorer. Don't forget that there are many Mac computer users, too. Set the resolution on your monitor to a lowest resolution (640x480 or 800x600) to see what others may see. Ask friends, family and colleagues to view your site from their computers at home.

Test the access speed. The site should load quickly enough for everyone using connections ranging from a 28.8 modem to high-speed cable and DSL connections.

5. Optimize for Search Engines
Register with search engines and directories. This is imperative for marketing your Web site. The top seven search engines (Lycos, Infoseek, Alta Vista, HotBot, Web Crawler, Excite and Northernlights) and the directory, Yahoo, are the ones that are most important. There are various formulas to successful search engine registration that require time and possibly professional assistance.

6. Review and update regularly
Review and update the content of your Web site regularly. After the initial publication you may wish to add the following enhancements:

Provide a "guest book" to collect the names and e-mail addresses of potential clients. This list can be used to send out e-newsletters and sales promotions.

Provide a street map to your business location on the Web. Customers can print it out.

Provide forms on your Web page that can be completed and submitted online for customers' convenience. (If inquiries are allowed in the forms, respond to them promptly! Most web users expect a response within 24 hours.)

Create a link to your e-mail on every page in your Web site. That way, if something on the page sparks a customer's response, you've made it easy for him or her to "talk" to you.

Offer an online newsletter. This could be an electronic version of a printed newsletter you already publish, something entirely different, or a combination of the two.

Feature some interesting history or suggestions about your area of business.

Provide a "references page" and include letters and photos sent by your customers showing the work you have accomplished on their property.

Diana Cardillo is senior technical support specialist at ArborSoftWorx. She can be reached at diana@creativeautomation.net or (410) 461-5858.

Resources in Print


The Everything Build Your Own Home Page Book: Create a Site You'll Be Proud Of, Without Becoming a Programmer (Everything Series), by Mark Binder, Beth Helman; Adams Media Corporation; ISBN: 1580620395; (September 2000).

On-line Resources:

The InteNic - information regarding Internet domain name registration services, WhoIs database, and list of accredited registrars and registrars that offer web hosting. http://www.internic.net.

Redwoods Susceptible to Sudden Oak Death

California’s towering redwoods are susceptible to the same disease that has killed tens of thousands of oaks in the past three years, scientists confirmed recently.

The *Phytophthora ramorum* microbe – better known as “sudden oak death” – has proven that it can spread from species to species, also possibly attacking valuable Douglasfirs, according to a *Reuters* report and an article in *USA Today*. The disease thus far has appeared only in redwood saplings and has not spread to the giant redwood forests; thus its effect on full-grown redwoods is not yet known. Nevertheless, there is still cause for alarm. If the disease does prove fatal to mature redwoods and Douglasfirs, spread of the pathogen would cost not only in terms of aesthetic value, but also have a substantial impact the state’s $1.1 billion timber industry.

“The implications of this disease are enormous, including a major change in the environment and landscape of California, severe economic dislocation, and an increase in fire danger – especially problematic in areas with high population density,” California Gov. Gray Davis said in a letter to President Bush regarding this issue. Davis requested $10 million to help fight the fungus.

The affected redwood saplings had lesions and discoloration on individual needles, and redwood seedlings exposed to the fungus exhibited lesions and discolored branches. Douglas fir seedlings exposed to the fungus developed even larger lesions.

As scientists further study the pathogen’s effect, they are also investigating whether the disease has infected trees as far inland as the Sierra Nevada mountains.

Pine-promoting Programs Of 1980s Come Full Circle

Government programs that sparked timber harvesting in the 1980s could mean lower market prices for pine for the next 15 years.

Pine harvesting in the southern United States was encouraged with such federal policies as the Conservation Reserve Program, which was started in 1985 and pays landowners to plant trees on marginal cropland or erodible land. Now, the effects of the popularity of such programs are being felt as a timber glut floods the market, threatening profit margins.

Marshall Thomas, president of F&W Forestry Services Inc., told *The Associated Press* that wood from the 32 million acres of pines planted since 1985 is heading to pulp and lumber mills.

“We already have a glut of pulpwood,” Thomas said. “What I’m forecasting is a glut of small saw timber.”

U.S. Forest Service forester David Hoge noted that prices for pine are also lower because there is less competition for wood, due in part to business consolidations, relocations offshore and mill closings. With fewer companies bidding for the wood, some landowners may find it harder to sell their timber, said Hoge.

Is This Oak the Next Mona Lisa?

One artist’s favorite oak tree has been immortalized in a painting so large, it won’t fit in most art galleries.

British artist Adam Ball created the 32-foot-by-22-foot life-size canvas painting as a tribute to his favorite oak tree in West Sussex, southern England.

“I painted on a specially made, weather-proof polyester canvas and used acrylic paint – 100 liters of it,” the artist told *Reuters* in an interview. “It took me three months to paint, but the whole project to get planning permission – to have the canvas hung from a scaffold – and to find a sponsor took about two and a half years,” the 25-year-old fine arts graduate said.

The huge painting hangs outside near Piccadilly Circus in London – too large to find a place in local art galleries.

“It was a very physical way of painting, walking around the canvas which was laid on the floor of a barn,” Ball said, adding he used mops as well as brushes to create his mammoth picture.

The artist said the painting has been sold to a private art collector. In the meantime, the future of “The Tree” includes a tour of Britain.
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A few autumns ago, I got a call one morning from a client who requested to have a hickory tree taken down as soon as possible. I asked if it had been struck by lightning, had limbs broken from a storm or was possibly uprooting? To each, she answered no. Sensing the urgency in her voice, I scheduled a visit for that afternoon. Arriving at the appointed time, I could see the aforementioned tree looming over the house in the rear of the property. “I’ll meet you around back,” she shouted from the front door.

Passing through the gate, and having been greeted by two overly-eager Springer spaniels, I did a quick assessment of the property: well-manicured landscape with a 50-foot hickory overhanging the swimming pool, flagstone deck, wooden fence, pool filter, shrubbery and the corner of the house.

“You’ll think I’m crazy but the reason I want this tree taken down is because…”

“Wait, wait, don’t tell me,” I said, stealing a line from the title of a popular PBS radio show. “Will you give me a chance to guess?”

“Give it your best shot,” she responded coyly, glowing with confidence from knowing that there was no way on this green earth that a humble tree guy could possibly fathom her motive for prompt removal.

What she didn’t know was that I’ve been around the block a few times and had heard most every bizarre explanation known to man for taking down a tree. There was the little old man in Philadelphia who scratched his bald pate on a low limb and the voyeur who wanted to see into his neighbor’s house. Then there was the tree with the crow’s roost above the convertible and the lady who was convinced the reason she had mildew on her inside walls was because of a tree 50 feet away. And I can’t possibly forget the eccentric old lady with the beat-up old garage who wanted the overhanging mulberry removed because she didn’t want to risk the chance of the tree damaging her Rolls Royce. I thought she was just another kook until I glanced in the garage and discovered an immaculate 1930 Phantom II. Armed with years of experience, there was no way I could fail.

“Well, the reason you want this tree down is because the falling leaves are difficult to skim off the top of the pool,” I ventured.

“Our pool service cleans three times a week,” she answered.

“The leaves are staining the bottom of the pool?”

“That’s not a concern.”

“You have to wear a hardhat to be protected from the falling nuts?”

“Nice try, but no.”

“The tree is casting too much shade on the pool?”

“We have a summer home in the Hamptons.”

With each negative reply, I grew a bit more desperate.

“You’re afraid the tree roots will lift the deck or crack the pool?”

“Keep going.”

“Birds are roosting in the tree and…”

“If this were 64 Questions, you’d have 58 left,” she said smugly.

I was just about ready to give up when the loyal readers of From the Field, like knights in shining armor or arborists wielding sharp chain saws, came to my rescue. Yes, loyal readers, that’s you! Help me come up with 58 reasons why this client wanted the tree to come down. The clues are staring you in the face.

Fax me at (301) 881-3695 with your ideas. Or, better yet, send me a quick story of your most bizarre reason for having to take a tree down. I will incorporate as many of your ideas as I can (along with your name) in the January issue of TCI when I reveal “the rest of the story.”

I’m betting $100 that no one gets the right answer! First one gets it.

Paul Wolfe II is president of Integrated Plant Care, Inc., in Rockville, Md. TCI

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