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Added to this solemn scene on Saturday, October 17, 1998, was row upon row of tree care equipment belonging to member companies of the National Arborist Association. Almost 600 volunteers from 80 companies in 20 states mustered before dawn to begin the NAA’s most grandiose National Day of Service ever. Zone coordinators met to review their work assignments, safety requirements and plans of action for the day. With almost 1,000 trees to prune and 25,000 gallons of fertilizer to distribute, these volunteers knew they had a full day ahead of them.

The whine of chain saws and roar of chippers filled the air as thousands of visitors made their way past the visitor’s center and on up the hill toward the grave site of President John F. Kennedy. At the entrance, they were greeted by volunteers who stood ready to explain the importance of urban trees and the need for professional tree care.

Above them in the cemetery’s massive oaks were arborists pruning and cabling—practicing the finest examples of professional tree care. Below, safety coordinators managed the flow of bystanders as grounds crews fed never-ending brush piles through chippers. Elsewhere, on a knoll just below the Tomb of the Unknowns, fertilizer crews tended to historic trees weakened by two consecutive years of drought.

As important and needed as the work performed was the way it was carried out. Not a single injury was recorded. Four Red Cross volunteers on duty spent the day marveling at the scene and enjoying a spectacular fall Saturday in Washington.

More than 10,000 tourists who visited the cemetery that day were fortunate to witness environmental stewardship of the highest order. The NAA is committed to educating the public about the environmental, economic and social benefits of trees through public service events such as a National Day of Service. These types of events help reinforce to the public that the preservation of existing trees in urban America is critical to our future.

At the end of the day, crews converged back at the assembly area to swap stories and pack their gear. Volunteers and sponsors alike took home more than T-shirts, baseball hats, photos and memories of a job well done. They made a statement—one that will be long remembered—about their respect for their profession, their willingness to give something back to society and their profound gratitude to those who made the ultimate sacrifice for the nation.

Mark Garvin
Editor
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Trees and Subsidence Damage:

A serious problem for localities on clay soils.

By Dr Giles Biddle

In England, subsidence damage attributed to trees has become a major cause for concern during the past 25 years. This situation has arisen because of the decision by insurers in 1971 to provide subsidence coverage on domestic building policies. Trees are the biggest cause of subsidence, and householders now realize that they can claim on their insurance, often for very trivial amounts of damage.

Traditionally in the UK, subsidence has been dealt with by engineers whose knowledge of trees is usually minimal. They have applied engineering practices to the control, seeking to stabilize the building by underpinning the foundations. This is not cheap, the average costs for each claim being about $20,000, and total claims being in excess of $900 million in a dry summer, making subsidence second only to fire for insurance payouts.

As a result, there is pressure to remove any trees which might be the cause of damage, often regardless of their involvement, and also pressure to remove or prune trees which are deemed a possible threat in the future. Much of this comes from insurers, but the public has now become alarmed and views trees as a potential threat to their houses. They are afraid of subsidence, and they deem that any risk, and thus any tree, is best eliminated.

At present in North America, subsidence is only seen as a minor problem, restricted to particular areas with problem clay soils. However, there are already indications that insurers are becoming concerned about a possible threat from trees, with the possibility that this could escalate into a similar situation to that seen in England. If this is to be avoided, there needs to be a much better understanding by all professions of the role of trees as a cause of subsidence, and a re-appraisal of the methods of investigating and remedying damage.

Mechanism of damage

Damage occurs to buildings as a result of excessive movements of the foundations. One mechanism for movement is changes in moisture content of a clay soil below foundation level; if a clay dries, it will shrink. Conversely it will swell if it rehydrates. These changes can be produced by the roots of any vegetation, be it grass, shrubs or trees. The important difference with trees is the depth and lateral spread of the root system, which enables them to take water from the soil beneath foundations.
The water is required to replenish the losses which occur as transpiration from the leaves during photosynthesis. During the winter, when a deciduous tree has no leaves, there is no water loss and, therefore, no water uptake by the roots. As a result, rainfall during the winter replenishes the moisture resources in the soil, so that the soil is at its wettest just as the tree comes into leaf. In the spring, as the leaves expand and photosynthesis starts, transpiration will also start and the roots will become active to replenish this loss. Summer rainfall is usually far less than the rate of loss, and so the soil becomes progressively drier, typically reaching its driest state in about September. Thereafter, rainfall is usually in excess of transpiration and the soil starts to rehydrate, typically returning to full moisture capacity sometime during the winter.

There is therefore an annual cycle of the soil drying during summer and rehydrating during winter. If it is a clay soil, this will produce a corresponding pattern with the soil shrinking during the summer and swelling during the winter. The amount of drying is dependent on the weather conditions, increasing during a dry summer, and also on the species of tree, its leaf area and its vigor. The amount of shrinkage is dependent on the amount of drying, and on shrinkage characteristics of the clay.

If these soil movements occur below foundation level, the building will subside during the summer and recover (move upwards) during the winter. Figure 1 illustrates this pattern of seasonal movement. Swelling forces generated in a clay soil are easily capable of lifting a house. In theory there should be full recovery as the soil returns to its normal moisture content, but in practice the constant changes in foundation load associated with this movement produces an irreversible downward ratcheting effect, which I term “dynamic settlement”. Damage to a building occurs when the angular distortion caused by any dynamic settlement is combined with the additional distortion caused by seasonal subsidence as it builds up to a peak in late summer. If the stresses associated with this distortion are excessive, cracks in brickwork and other damage develops.

Research and experience shows that in the vast majority of cases in England, there is full rehydration of the soil each winter. However, some clay soils have very low permeability, and if these are dried to sufficient depth, the soil is unable to recover fully in a single winter. In successive years, the roots will have to go deeper or further to obtain their moisture, so that there is a progressive increase in soil drying associated with the development of a deep-rooted zone of persistently desiccated soil.

Recovery of moisture into this soil can take many years, causing long-term swelling movements of the clay, referred to as heave, throughout this period. Recovery will occur if the tree is felled or its water requirements are reduced for any other reason, for instance, as a result of pruning. As we shall see, this has important implications for any remedial action.

The development of a persistent moisture deficit is shown diagrammatically in Figure 2. Research and experience shows that, if a persistent deficit establishes, it usually does so over comparatively few annual cycles, at the stage when the tree is growing fast in early maturity. Thereafter, it can be maintained over many years until it gradually diminishes as the tree goes into over-maturity and decline.

In some of the southern states of America, some clay soils have a natural state of desiccation produced solely by evaporation from the soil, without the involvement of transpiration by vegetation. If buildings are constructed on these soils, which are termed “expansive soils” in this situation, they protect the soil from evaporation thus allowing it to rehydrate and swell, producing a similar heave damage.

These conditions lie outside my experience from England, and may impose a need for modification for some of the recommendations in this article.

Remedial action after damage

Although investigation of damage should precede any remedial action, it is helpful to consider the remedies first, as these should dictate what investigations would be most appropriate.

The objective of any remedy is to restabilize the foundations permanently, so that superstructure repairs to any damaged brickwork can be undertaken with confidence that similar damage will not recur. The traditional method, as usually applied by engineers, is to underpin, using various methods to increase the depth of foundations to below the level of any soil desiccation and movement. However, underpinning has its disadvantages, not least in the costs and the disruption to the homeowner during the work. In theory, if only part of a building is moving, it is only necessary to underpin that area, but, as this creates differential foundation depths, it can aggravate the situation if there is any other cause of movement in future. Al-

Figure 1. Diagram of seasonal movements and associated dynamic settlement.
though in theory a properly designed and executed underpinning plan should allow retention of adjacent trees, in practice the engineer or contractor will demand their removal as an added safeguard (for their reputation as much as for the building). Underpinning usually has no benefit for the environment.

An alternative option is to identify the cause of the foundation movement and deal with that in an appropriate fashion so as to restabilize the foundation. Wherever the movements are predominantly seasonal (Figure 1), complete restability can be achieved by eliminating the cause, i.e. if the movement is caused by a tree, by felling that tree. This approach has an obvious environmental cost, but, provided it is properly targeted so as to remove only those trees which are the actual cause of damage, as opposed to a general “scorched earth” policy, the extent of tree removal is usually tolerable.

As an alternative to felling, in some cases it is sufficient to reduce the amplitude of the seasonal movement to below a threshold which can be tolerated. This can be achieved by pruning the tree so as to reduce the leaf area and thus the amount of water lost as transpiration. As buildings will tolerate some movement without damage, in theory this should be effective, but in practice there are many problems. In particular, most tree species will respond to pruning by vigorous production of new shoots and leaves, so as to restore the original leaf area as rapidly as possible. It is therefore necessary to continue the pruning on a regular basis for as long as the tree is retained. It is also necessary to prune quite hard, as a damaged building will usually be more susceptible to further damage. It is usually questionable whether a tree which requires regular and heavy pruning is an asset, or whether it should be replaced with a more appropriate tree in a better location.

In a few circumstances other options, such as root barriers or the targeted provision of water so as to control the location of significant soil drying, may be viable but there are usually practical problems to implement them or to ensure their long-term effectiveness.

It must be emphasized that any remedies involving vegetation control will only be effective if movements are entirely, or predominantly, seasonal. If there is a significant persistent deficit...
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Investigation of damage

Engineers investigating damage usually concentrate their efforts on the soil conditions, digging a series of trial pits to determine the type of soil and foundation depth, and boreholes to try to determine the depth of any desiccation. Inspection of the crack pattern, possibly combined with monitoring changes in width of some cracks, provides the basis for the diagnosis of subsidence. These investigations may be considered appropriate and adequate for their decision to underpin.

However, if tree management is to be the preferred option, a radical re-appraisal of the methods of investigation is required. In particular one needs to know:
- whether movements are seasonal, which will confirm that it is caused by the influence of vegetation on a clay soil.
- whether there is an underlying persistent moisture deficit, as this will preclude vegetation management as an option.
- which parts of the building are moving. This, combined with identification of the adjacent trees and assessment of their current and previous growth, will usually identify the most likely culprit(s).
- how much the building is moving. There is usually very poor appreciation of the extent of foundation movement. Even minor cracks will usually involve seasonal movement with an amplitude of at least 10mm, and 20mm or more is common. However, it is difficult to predict how these movements will translate into damage, as it depends on their distribution through the building, and on the ability of the building to tolerate some movement. Unless the movements which caused the damage have been measured, it is difficult to assess the efficacy of any remedial action.

Essential information on all of these matters can be obtained by monitoring changes in the level of the building. This requires fixed markers at suitable intervals around the building and possibly on some internal load-bearing walls. Brass screws firmly mounted in plugs are ideal for this purpose as they are unobtrusive,
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cheap and quick to install. They can support a suitable staff so that, with the aid of a precision optic level, the level of the markers can be accurately determined, preferably to the nearest 0.1mm. Any movement of the foundations can then be measured by taking further similar sets of readings at appropriate intervals. I find that, with reasonable care and suitable equipment, I can routinely achieve a closing error of substantially less than 1.0mm in each traverse around a typical building, with the readings taking about one hour working single-handed. This should overcome the concerns of some that level monitoring is slow, expensive, or of inadequate accuracy.

Damage caused by tree root activity typically occurs in late summer, when the soil is driest. Level monitoring should be started as soon as the homeowner reports the damage. Movements through the first winter will show whether parts of the buildings are moving upwards during the winter. Upward movements can only be caused by rehydration and swelling of clay, thereby confirming the involvement of vegetation. If several sets of readings are taken through the winter, and there is a persistent moisture deficit, the rate of movement will remain fairly constant with significant movement still continuing in late winter, indicating that there is the potential for this movement to continue. By contrast, if the movement is entirely seasonal, upward recovery will slow and cease through the winter.

The distribution of the recovery movement, and knowledge of the likely influence of adjacent vegetation, will usually be sufficient to indicate which trees or shrubs are the likely cause. Movements are usually greatest close to the tree, diminishing with distance. Very localized movement suggests a local tree or shrub. On the other hand, movements over a wide area may be caused by a tree capable of causing extensive soil desiccation. If the tree is mature with little recent growth, one would expect to see evidence of similar damage in the past, possibly masked by careful repair, whereas damage occurring for the first time implies a change in circumstances, such as a rapidly growing tree or one which was pruned but has been neglected.

It has long been recognized that there are differences between genera in their influence on the soil, for instance that an oak is more likely to cause damage than a linden, which is more likely to damage than birch. There is a danger that this can cause us to pigeon-hole genera, putting each genus on its step on a ladder.
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are differences between genera in their influence on the soil. For instance, an oak is more likely to cause damage than a linden, which is more likely to damage than a birch. There is a danger that this can cause us to pigeon-hole genera, putting each genus on its step on a ladder. In practice, there is likely to be considerable variation between individuals within each species and between species in the genus, i.e. different genera overlap, as if on a sloping gradient, from the most to the least likely to cause damage.

At present we cannot quantify the difference between genera, but merely use the term ‘water-demand’ to denote the ability of vegetation to cause drying of a clay subsoil. In the past classifications of this sort in England have only included a limited range of genera, subdividing into high, moderate and low water demand. Figure 3 provides a more detailed six-stage classification of genera common in England, based on my current tentative and subjective opinions.

Information of this sort, combined with assessment of the growth and transpiration of the tree and the pattern of building movement, can be used to identify which tree, or trees, are the most likely cause of damage. If the building levels have been monitored through the winter, the decision on the appropriate remedial action can then be taken and implemented in the spring, before a further cycle of soil drying can start.

If the remedial action is to fell or prune the tree, it is very desirable to be able to demonstrate to the house owner that simple action of this sort has been sufficient to restabilize the building. A period of further level monitoring, through at least a further summer, can demonstrate this. Further readings can also be taken at any time in the future, for instance if trees have only been pruned, as a check on the adequacy of the pruning regime.

Level monitoring will, therefore, provide most of the information required if tree management is the preferred remedy. In my opinion, it should become an essential part of all investigations whenever the involvement of trees is suspected. I am not advocating that arborists should be involved in obtaining this information, as this is a matter for the engineer, but arborists should insist that any decisions concerning trees are only made in the light of proper evidence, including level monitoring.

Other investigations may also be relevant. A level distortion survey (measuring the level of a brick course or internal floors all around a building at one moment in time) to demonstrate the total amount of distortion in a building is a useful adjunct to level monitoring. It relies on an assumption that the building was constructed level in the first place. Distortion may have occurred as a result of many factors, including existing or previous trees, or from other causes.

Trial holes may also be needed to establish foundation depth. Root samples can be taken from below foundations and identified as a further check on the involvement of a tree, but it is unreliable to use root identification as a means for determining which tree is involved in any damage. The samples are often taken
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from only the most obvious roots, but there may be others which are more relevant as the cause of soil drying.

There is also a role for soil investigation, at least to establish the presence of clay. However, considerable caution is required in the interpretation of soil tests, particularly the assessment of desiccation. Comparison of moisture content with soil parameters, such as the liquid and plastic limits, are at best very crude and are often misleading. Soil suction tests are a recent development which provide a more reliable method for assessing desiccation, but their limitations are often inadequately appreciated. It may be useful to test the soil in the spring to determine whether a persistent deficit is present, but even qualitative assessments of residual heave potential are usually inadequate, and quantitative measurements are likely to have a massive potential error. The most relevant information from soil testing should be an assessment of soil permeability, as it is this which determines the rapidity of rehydration and recovery. However, it is very rare to find mention of soil permeability in any soil reports.

**Prediction and prevention of damage**

Arborists have an important role in ensuring that trees and buildings can co-exist within acceptable bounds. For new housing this should be simple, as the depth of foundations can be increased to minimize any risk of damage. A deep basement will usually provide sufficient depth. Alternatively, short-bored piles for all housing on clay soils would prevent future damage.

Although it is practical to increase the depth of foundations for new housing, this is not an option for existing houses on clay soils which have shallow foundations and are potentially vulnerable. It is appropriate to consider whether trees in proximity to these properties should be actively managed so as to prevent damage from occurring. Any such management policy should be based on analysis of the benefits and costs (both financial and environmental) of doing so.

If the normal consequence of damage was a need to underpin, there would be a considerable benefit in avoiding the associated costs. However, as previously emphasized in this article, in most situations it is only necessary to identify and remove the offending tree, and then carry out appropriate cosmetic repairs, the cost of which is usually minimal. There is little benefit in trying to avoid these costs, unless damage becomes excessively frequent. Unfortunately, even in England there is negligible data on the frequency of damage. Data has been collected on the proximity of trees where damage has occurred. For instance, it is known that in 50 percent of cases of damage involving oak trees, the tree is closer than 9.5m, in 10 percent it is closer than 18m, and that the maximum recorded distance for damage is 30m. Similar data is available for most common tree genera. While this tells us something about situations where damage has occurred, or might just possibly occur in future, however, in the absence of information on the number of trees at comparable distance where damage has not occurred, it provides no information on the risk of damage. Observation suggests that, even at only 9.5m distance, probably fewer than 1 percent of oak trees on clay soils will cause damage.

Regrettably, in England an influential engineering report took the maximum recorded distance for the different species (i.e. 30m for oak), quoting this as a “safe distance”. This was subsequently taken by others, particularly the national press, as being literally a safe distance, and that trees will cause subsidence at anything closer. This mis-application of the data is at last being corrected, but it will take far longer to restore the public’s confidence that trees are not necessarily an immediate threat.

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**Figure 3. Classification of water demand of different genera.**

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The confidence of the public in England is not aided by the request from insurance companies for "arboricultural reports," particularly at the time of house purchase. It is not surprising that surveyors, seeing a tree in proximity to a building and mindful of their professional indemnity liability, refer to it in their report, often even without reference to soil conditions. Arborists are then instructed to report on the subsidence risk, but as they are also mindful of their potential liability, they may play it safe and advocate totally unjustifiable pruning or felling of trees. A similar situation could easily develop in the United States.

If this is to be avoided, arboriculturists must have suitable guidelines on which to base their advice. However, I have long advocated the opinion that, as the components of the interacting system of trees/soils/buildings/weather are each so variable, their interaction is totally unpredictable. It is not practical, therefore, to make predictions of the risk of damage. Furthermore, if the unnecessary costs of underpinning can be avoided, there is no economic justification in commissioning these reports.

In response to demand for these reports, I have assisted the Arboricultural Association in producing a method of subsidence risk assessment (SRA), based on our current best practice on foundation design near trees. This takes into account our current knowledge of different tree species (as in Figure 3), the crown area and vigor of the tree, the soil conditions, weather conditions in the area, and other special factors. From this the method calculates an ideal foundation depth which is compared with the actual depth to derive a numerical value of the risk.

The SRA system is as good as can be achieved in the light of current knowledge. However, analysis of case studies where I have monitored building movements show no correlation between the risk value and recorded movements. Furthermore, analysis of recent cases shows that, in just over 50 percent of cases where damage has occurred, the method would have indicated an insignificant risk. The method, or any other methods currently available, clearly have no value for predicting risk. This confirms my opinion that risk prediction is inappropriate, and that insurers must be persuaded to stop asking for these reports.

Instead one must accept that trees will occasionally cause damage. If this occurs, the property will restabilize with a need for only minor cosmetic repairs—provided prompt action is taken to investigate and deal with the offending tree. This approach is preferable on both environmental and economic grounds.

This article is based on one in Tree News, the newsletter of the Tree Council, London. Giles Biddle is a Registered Consultant and past chairman of the Arboricultural Association of the UK. He is the author of the recently published book "Tree Root Damage to Buildings" which provides a definitive and practical guide to the problems of subsidence. Details are available from Willowmead Publishing Ltd, Ickleton Road, Wantage, OX12 9JA, England. Tel/Fax: 0114 44 1235 768034.
Endomycorrhizae: Colonize the inside of plant roots to benefit turfgrasses, most ornamental plants, hardwoods, fruit and nut trees and shrubs.

How Mycorrhizal Inoculant Products Work

Any condition that affects root growth influences mycorrhizal development. For example, grossly over-fertilized and watered plants produce rapidly growing absorbing (white) roots that contain few available sugars, so these roots are much less susceptible to mycorrhizal fungal action. Research has shown that soil-enriching bacteria, natural surfactants and soil-water managing gels are very effective in stimulating root fibrousity (fine absorbing roots), rooting depth and mycorrhizal development.

High light intensity and moderate soil fertility encourage mycorrhizal colonization. Some fungicides can have a detrimental effect on mycorrhizae, while some are beneficial. In general, insecticide and herbicide applications do not affect mycorrhizae.

Once colonized, mycorrhizal fungi spread to new roots in new soil areas and continue to thrive as long as root growth is maintained and soil conditions are appropriate.

How to Select Mycorrhizal Fungal Products

Commercial access to mycorrhizal fungi is due, largely, to the research begun 40 years ago by the U.S. Forest Service’s Dr. Donald H. Marx. Awarded the 1991 Marcus Wallenberg Prize (considered the Nobel Prize for forestry) for his research, Dr. Marx continues his work as Chairman and Principal Scientist of PHC, Inc. The Company is the world’s leading producer and supplier of mycorrhizal fungal products. Experts worldwide agree that use of mycorrhizal fungi in plant health management will become universal in the new millennium. However, because production of these beneficial fungi requires significant technical investment and expertise, buyers should be very selective about what products they purchase and who they purchase from. Ask these important questions before you make a product purchase:

Q. Does the product manufacturer, packager and seller have adequate scientific expertise and technical knowledge to guarantee quality and proper use? Growing, formulating and delivering mycorrhizal fungal inoculants require significant in-house scientific expertise. Four PhD specialists are on staff at PHC, Inc. to ensure quality control, to develop usage guidelines, and equally important, to answer customer questions.

Q. Are you buying long-lived spores or short-lived propagules? Many products that claim to be viable endomycorrhizal inoculants contain mostly fungal propagules in root fragments and very few viable fungal spores. Published research shows the fungus in these root propagules only survive for 10 to 20 days after production. PHC, Inc. products contain a guaranteed number of quality dormant spores that are viable for a minimum of 18 months after production. PHC, Inc. conducts independent spore viability tests and plant root colonization on all of its products to ensure they work as represented.

Q. Is the product guaranteed pathogen-free? Since endo (VAM) spores are produced on plant roots, the potential for the unintentional propagation of fungal pathogens and nematodes with the mycorrhizal fungal inoculum is high. Random sample testing of several commercially available “me-too” products show they contained an abundance of undesirable pathogenic fungi and nematodes. All PHC Mycor” and MycorTree" brand products are guaranteed pest-free with the full backup of rigid laboratory Quality Control production standards and protocols.

More than 400 million years ago, plants evolved a symbiotic relationship with mycorrhizal fungi—a relationship that remains critical to plant health today.

Mycorrhizal fungi (fungus roots) are unique, root-inhabiting fungi that colonize plants outside (ectomycorrhizae) or inside (endomycorrhizae) fine absorbing roots to obtain essential organic chemicals. In return, the fungi extend vegetative strands (mycelia) far into the soil to extract water and essential elements and share them with their host. Mycorrhizae are able to absorb, accumulate and transfer all of the 15 major and minor mineral elements and water to plants more rapidly than roots with no mycorrhizae. Decades of research show that mycorrhizae increase the tolerance of their plant host to drought, compaction, high soil temperatures, heavy metals, soil salinity, organic and inorganic soil toxins and extremes of soil pH. They also depress many root diseases caused by pathogenic fungi and nematodes.

CONTACT PHC TECH SERVICES AT 1-800-421-9051
According to scientists, for every single destructive species of bacterium found on Earth, there are more than 30,000 species that are beneficial or neutral to plant and animal life. Through biotechnology, PHC scientists identify, isolate and commercially produce beneficial bacteria species to improve our environment and quality of life. A variety of bacteria species have been formulated into “plant health care” products that promote biological growth, prevent damaging foliar and soil pathogens and pests, and cleanse ponds and lakes.

**Beneficial Bacteria**

Soil bacteria decompose organic matter, including cellulose and lignin in wood, a process essential to all life on Earth. Primarily they are found in the upper 12 inches of soil where their carbon food source is most prevalent and where aerations, mineral elements, pH and temperature are more ideal. A half thimble of productive soil may contain up to 3 billion bacteria from thousands of species that carry out different activities in soils.

Beneficial Rhizobacteria, are found in the root zone of all plants (and turfgrasses). Rhizobacteria have adapted themselves to plant’s absorbing roots where they get nutrients from sloughed root cells, exudates and organic matter. In return, they provide plants with specific benefits and are largely responsible for soil health.

For its products, PHC, Inc. selects soil bacteria and rhizobacteria that produce specific responses:

- **Plant-Growth Promoting Rhizobacteria** produce a variety of chemicals and natural hormones that stimulate plant growth under stress
- **Free-Living or Non-Symbiotic Nitrogen-Fixing Bacteria** increase plant growth by fixing atmospheric nitrogen for plant use
- **Phosphate-Solubilizing Bacteria** solubilize phosphorus for plants from insoluble mineral sources
- **Bacteria Antagonistic to Root Pathogens** produce antibiotics or are hyperparasitic to inhibit root pathogenic organisms, such as *Pythium*, *Fusarium* and *Rhizoctonia*
- **Mycorehizosphere Bacteria** improve mycorehizal development and their function

**PHC® BioPak**: Dry, water soluble biofertilizer/biostimulant with multiple strains of growth-promoting, Nitrogen fixing and Phosphorus solubilizing bacteria. Promotes fast feeder root development, stimulates plant growth and improves nutrient availability and uptake.

**PHC® Complete**: Dry, dispersible rhizosphere inoculant that contains 20 strains of microencapsulated bacteria antagonistic to root pathogens. Formulated with dry soluble yucca extract and organic biocatalysts to ensure rapid colonization of the plants’ rhizosphere to minimize turf diseases and improve nutrient availability.

**Healthy Start** 3-4-3 Biofertilizer:
Healthy Start® is a natural biofertilizer and soil conditioner which is ideal for new plantings, seeding, sodding and flower beds. It contains Nitrogen-fixing and Phosphorus solubilizing bacteria, along with organic NPK and a full range of micronutrients derived from organic plant and animal proteins, combined with humic acids, yucca plant extracts and sea kelp meal.

**Insect-Toxic Bacteria**

Some beneficial bacteria contain toxins that are fatal to insects but harmless to plants, animals and humans. The best known, *Bacillus thuringiensis* (Bt), have produced some of our most reliable and potent biological control measures. Bt is a common soil bacteria that produces crystal proteins and spores with insecticidal properties. Formulated into Bt bioinsecticides and then foliar-applied, these proteins/spores control a broad spectrum of caterpillar pests. The targeted pest consumes the proteins/spores, becomes sick and unable to eat, and soon dies.

**Crymax® WDG bioinsecticide**: The most potent Bt technology available to gardeners. It is twice as strong as traditional Bt products— for better, longer lasting control of caterpillar pests. It contains three different insecticidal proteins to provide broad spectrum biological control of all caterpillar pests found in ornamental trees and shrubs, including diamondback moth. Crymax® is available in a dry, water dispersable granule (WDG), so it is easy to store, handle and apply.

**Water-Cleansing Bacteria**

Cloudy water, pond odor, scum and algae blooms—the most common pond maintenance complaints—are caused by excessive levels of nutrients, from the leaching and inflow of fertilizers and buildup of organic matter. These elements are food nutrients that promote the growth of algae and anaerobic bacteria. Water-cleansing bacteria, contained in high concentrations in PHC, Inc. products, bio-logically cleans, clarifies and deodorizes fresh water. These specialized bacteria digest ammonia, nitrates and phosphorous and degrade hydrocarbons and plant material. Without food, algae and anaerobic bacteria are kept in check and water quality improves.

**PondSaver**:
Contains more than 5 billion colony-forming units of 17 different proprietary strains of dry, live bacteria per gram. Reduces clouding, sludge and unpleasant pond and lake odors.

PLANT HEALTH CARE, INC.
Plant Health Care, Inc. (PHC, Inc.) is a microbial biotechnology company specializing in the development of “plant health care” products and natural systems solutions for the commercial tree care, horticulture, turfgrass, aquatic, forestry and land reclamation industries.

Green for Life™
For more information about beneficial bacteria and mycorrhizal products, call 1-800-421-9051 to order a Green for Life guidebook and catalogue of PHC, Inc. biological products.

PHC®, BioPak, Healthy Start®, Complete®, Mycore, MycorTree®: A Natural Systems Approach®, Green for Life™, and PondSaver® are trademarks of PHC Royalty, Inc. Crymax® is a trademark of Ecogen, Inc. ©1998 PHC Royalty, Inc.
Researchers from around the world discussed and evaluated the development of disease-resistant elm trees last month at the first International Elm Conference. Scientists and arborists also gathered information about virus-like particles that kill elm disease fungus, a compound that immunizes healthy trees against Dutch Elm Disease (DED) and the new trend in community-based elm disease policing groups.

More than 170 researchers, scientists and arborists attended the conference, hosted by The Morton Arboretum. The conference featured more than 30 international speakers whose research focused on the management and history of elm disease, such as DED and Elm Yellows.

“The interaction and collaboration we saw between researchers from all over the world has everyone coming away from this conference very optimistic,” said Dr. Christopher Dunn, Morton Arboretum director of research and conference coordinator. “Tree professionals and tree lovers now have a better arsenal with which to fight elm disease.”

According to Dunn, elm disease research relies on the interaction between arborists, who do field work, and scientists who do research. But communication between arborists and scientists has been fragmented, and discussions have been based largely on anecdotal evidence. The conference allowed the two groups to develop a clear line of communication that will be used to share substantive data.

Results from research on hybrid elm trees revealed that newer types are showing encouraging signs of disease resistance. The Valley Forge Elm, developed at the U.S. National Arboretum, shows no disease susceptibility, is easy to grow and resembles the traditional American Elm. The Accolade Elm, developed at The Morton Arboretum, displays an attractive foliage and a resistance to disease-carrying beetles.

“By working together to develop these disease-resistant hybrids,” Dunn said, “we can get them into the nurseries quickly so people can enjoy them.”

British scientist Clive Brasier presented his research with d-factors, which are virus-like particles that kill the fungus that causes DED. Beetles that spread DED also spread d-factors, thus providing a viable biological control. Brasier’s presentation provided tree professionals with a starting point from which to implement the use of d-factors around the world.

Many researchers also had their first introduction to a new compound that immunizes elm trees against disease, Dutch Trig, developed by scientists in the Netherlands, is injected directly into healthy elms. It could lead to new areas of elm disease research and play a major role in preventing the loss of elms on a large scale. The product is not yet available in North America, but The Morton Arboretum plans to use it experimentally until the compound receives approval from the U.S. Department of Agriculture and the Environmental Protection Agency.

An effective new movement toward community-based elm disease policing using volunteers was also a hot topic at the conference. Cities such as New York, Sacramento and Winnipeg, Canada, have not-for-profit groups of citizens who are trained to spot elm diseases, thus providing an early warning system for arborists. Many of the professionals at the conference expressed interest in starting similar groups in their home towns.

The research program at The Morton Arboretum is the largest at any arboretum in America. The Arboretum research has led to the development of more than 100 new strains of elms, 25 of which are promising in terms of their strength and resistance to disease.

For more information, contact The Morton Arboretum, 4100 Illinois Route 53, Lisle, IL 60532.
Introducing the 335XPT arborist saw, built for life in the trees. It’s light and balanced, and features our exclusive ArborGrip™, a textured handle with thumb and throttle finger supports to give you a stronger grip for better control. Plus, its snag-free shape and built-in rope ring make it a cinch to haul up. Now nobody is more committed to the arborist than Husqvarna. We offer a full line of specially designed safety gear, and are proud to sponsor ArborMaster training programs. To find your nearest Husqvarna Power Retailer, just call 1-800-HUSKY 62. For information about ArborMaster Training, call 800-487-5958, ext. 8-4513.
Candid comments from our readers

**ASCA Standards Clear**

I read with interest John Hushagen’s article, “An Industry Story That Needs to Be Told” (TCI, September 1998). As a consulting arborist who has performed hundreds of tree appraisals, I have some concerns about his comments.

First, Mr. Hushagen admits to making a mistake (removing trees without permission). Everyone, including professionals, makes mistakes and the only honorable thing to do is to learn from them and move on. He has obviously learned to obtain permission from all parties involved prior to performing any tree work. However, instead of moving on, he seems to be venting his admitted anger at the consulting arborist.

He accuses the consulting arborist of wanting to “act like a lawyer,” acting as an advocate for his client, “especially when billable hours are the only source of income.” Advocacy, impartiality, independence and objectivity are extremely important ethical components of any consulting practice and are clearly defined in ASCA’s Standards of Professional Practice, to which each member subscribes. To breach these standards is a serious charge, not to be taken lightly.

As far as I can tell from this article, there is no evidence to support Mr. Hushagen’s claim of client advocacy on the part of the consulting arborist. His primary (only?) objection to the appraisal is the 60 percent condition rating for a topped tree. Anyone who has ever attended a training session in tree appraisal knows that you can ask a roomful of appraisers to assign a condition value to a particular tree and you will come up with a roomful of different values. Also, remember that there is more to a tree’s condition than its canopy. In fact, in *Guide for Plant Appraisal*, eighth edition (1992 International Society of Arboriculture), there is a scoring procedure for the condition rating which is equally weighted between Roots, Trunk, Scaffold Branches, Smaller Branches & Twigs, and Foliage. Perhaps only 20 percent of a tree’s condition rating should be based on its scaffold branches? Another point is that some species are known to tolerate topping better than others, possibly resulting in a slightly higher condition rating (Note: as a Floridian, I am unfamiliar with hawthorns and how they respond to topping). This would be the appraiser’s subjective opinion based upon his/her knowledge and experience (an acceptable practice).

I also wish to point out the huge discrepancy between the consulting arborist’s values and those of Mr. Hushagen’s consultant ($1,000 per tree vs. $375 per tree). How much closer would these values have been to each other if the condition rating had been different? Even if the condition rating had been 20 percent or 30 percent, it is doubtful that the appraised value would have approached $375. Could this be cause to suspect advocacy on the part of Mr. Hushagen’s consultant?

Because damaged trees are often gone by the time an appraisal is requested, consulting arborists frequently appraise tree damage using photographs, treatment records and verbal testimony. This is an unfortunate fact of an appraiser’s life. In these situations we do the best we can, but there is always room for discussion or negotiation. That is where the judge comes in and in this case, the judge ruled in favor of the consulting arborist’s report.

Another point to remember is that it takes the same number of billable hours to assign a 60 percent condition value as it does any other value. The time involved to evaluate the tree and perform the calculations is the same, whatever the values or the outcome. A consulting fee of $262.50 to perform such a service is certainly within an acceptable range and probably lower than many. It’s hard to believe that a consulting arborist would even be tempted to compromise his/her integrity or reputation for a fee of this magnitude.

My unsolicited advice for Mr. Hushagen is: Get over it.

Lisa H. Hammer
Horticultural Consultant
Homestead, Florida

**Consultants Advocates for the Truth**

I assume you will get numerous letters in response to Mr. John Hushagen’s experience that you printed in the September issue, regarding his experiences with the court system and consulting arborists.

Of course, I don’t blame him for being upset, but let me point out some discrepancies in his feelings of bitterness. Obviously I don’t have all the facts, but I would like to clear up some things from his letter.

First of all, why was he stunned that the court gave him 100 percent of the blame. It sounds like his company was completely to blame, not the client. The court does not care that is was an honest mistake; only that the mistake was made.

Then he makes a big deal that the plaintiff’s expert based his appraisal on trees that he had not seen (which happens a lot) but did view the trunk remnants and photographs. Mr. Hushagen’s tree appraiser probably did not have even that much evidence on which to base an appraisal.

It would be interesting and appropriate
Specifications:

A. General:
1. All G-60 Galvannealed Material (zinc coated, resists rust)
2. All Wiring in Conduit
3. Sealed Lexan Lens Lights Meet FMVSS 108 Specifications
4. Anti-Sail Mud Flaps
5. Hoist with Power Take Off
6. Trailer Light Connector, Six Pole
7. Pintle, Pin, or Pintle/Ball Combination Trailer Hitch with Tow Hooks
8. Bodies: Mounted, Undercoated, Chemically Degreased, Coal Tar Epoxy Coating inside Chip Box, Primed and Painted
9. Stainless Steel Hinge Pins with Grease Zerks
10. Weatherproofed Tool Boxes
11. Chipper Air Exhaust Vents

B. Overall Body Dimensions:
   Length: 168"
   Height: 72" (Inside)
   Width: 92"

C. Chip Box Material: (Galvannealed)
   1. Floor: 10-ga. plate
   2. Sides & Front: 12-ga. plate
   3. Top: 14-ga. plate
   4. Tailgate: 12-ga. plate with tubing frame (270° swing)
   5. Runners: 8" structural channel
   6. Cross Members: 3" structural channel
   7. Rear Vertical Support: formed 1/4" plate
   8. Rear Horizontal Support: 4" x 4" x 1/4" square tubing

D. Tool Boxes: (14-ga. Galvannealed)
   1. Underbody Tool Boxes:
      (two) 48" long x 20" high x 20" deep
   2. "L" Cross Box:
      24" long x 92" wide x 26" high across chassis rails
      Door: 24" long x 48" high; six rope hooks, stationary shelf and water cooler holder
   3. Ladder Box: (inside chip box)
      143" long x 17" wide x 27" high
   4. Pruner Box: (inside chip box)
      168" long x 17" wide x 12" high
   5. Locks:
      Slam, keyed with hidden theft resistant rods

E. Optional
   1. Tool boxes and Step-Type Rear Bumper
      Behind rear axle 34" long x 20" high x 20" deep
   2. Cab Protector
   3. Top Ladder Rack with Access Steps
   4. Electric Trailer Brake Control
   5. Wheel Chocks and Holder

NOTE: Chassis Cabs Available to complete the package 102" CA Chassis Cab required.

See us at TCI EXPO '98!

Southco INDUSTRIES, INC.
to the article to see the method that each appraiser used, as well as their worksheets. It is entirely possible that both appraisals were extreme. It sounds as if the plaintiff’s expert used the trunk formula method, thereby the condition factor debate. Even if the 60 percent may have been excessive, it would not have reduced the dollar amount anywhere near the defendant’s appraisal.

Then as to the trial itself; did either party have a lawyer to advise them or the consultant to appear in their behalf? It is obvious which side made the best presentation, which is what wins court cases.

I agree with Mr. Hushagen’s recommendations about getting signed authorizations, permissions, and telephone numbers, but would like further explanation about one lesson he learned: “beware of consulting arborists who want to act like lawyers.” He seems upset that consulting arborists rely on billable hours as their only source of income. Isn’t this what consultants of any kind do? If we sold anything else along with our consulting, it would be a conflict of interest.

His statement about advocacy is correct, an expert witness should be an advocate of the truth. However, it probably seemed more reasonable to the judge in this case that Mr. Hushagen’s appraisal of $375 per tree was as much (or more) advocacy as the $1,000 appraisal.

In almost every court case there are two opposing, expert witnesses, or appraisers, each stating that the other is wrong.

I feel for Mr. Hushagen and his experiences, but rather than to blame consulting arborists for his demise, he should be looking at his own business practices.

Lew Bloch
Registered Consulting Arborist
Potomac, Maryland

Assigning Blame

I read with amazement and disappointment the article, “An Industry Story That Needs to Be Told.” By his own admission Hushagen erred and unlawfully removed two trees on neighboring property.

What Hushagen calls “an honest mistake” is obviously a gross error in judgement and a breach of sound management practice. His article lacks any evidence indicating that the appraising arborist acted outside the appropriate role of an appraiser.

It appears that, rather than to admit responsibility and accept the consequences, he wants to transfer blame to the tree appraiser. This type of behavior demeans the profession and diminishes us all.

Favero Greif/erieb
Consulting Arborist
Seattle, Washington

When you need strong tree crotch support, remember the 3R's...

Reinforce...
... the crotch of a tree with a prefabricated TREE-CROTCH™ Grip from Preformed Line Products. TREE-CROTCH Grips are manufactured from heavy coated galvanized steel, and have a strength capacity of 5,000 lbs. to provide consistent reinforcement for high stress areas.

The TREE-CROTCH Grip comes in three sizes: 20", 30", and 36", to accommodate short tree crotch lengths.

Reduce...
... costs by eliminating the need for common grade cable inventory and labor intensive serving methods. TREE-CROTCH Grips are easily installed and do not require any special tools, so chances of workmanship errors are reduced.

The specially designed captive loop holds the thimble securely in place, eliminating lost parts and making the overall appearance neat and uniform.

Relax...
...TREE-CROTCH Grips, like all PREFORMED™ products, are lab-tested and performance proven to maintain a standard of excellence unmatched in the industry.

Remember the 3 R's:
• Reinforce the tree crotch.
• Reduce costs, installation time, and workmanship error.
• Relax knowing you've chosen a quality PREFORMED product.

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See us at TCI EXPO '98!

In-n-o'-va•sh-en
n.: 1. a new idea, method, or device
2. Morbark
In a small farming community in Iowa settled by Dutch immigrants, with a population of less than 11,000, resides Vermeer Manufacturing Company, a proud supplier of the tree care industry. One of the premier companies of the '90s, Vermeer is gearing up to step into the new millennium as a force to be reckoned with.

Vermeer Turns 50

By Sachin Mohan

A Visionary Company

Based in Pella, Iowa, Vermeer employs 2600 men and women in seven production facilities. Products include a full line of directional boring systems, tub grinders, utility and track trenching equipment, tree equipment and agricultural products. They also offer sales, parts and service through a worldwide dealer organization.

Vermeer’s “4Ps” philosophy has guided the company through years of business decisions.

Product - We wish to provide products and services of the greatest possible value to customers, thereby gaining and holding their respect and loyalty.

People - Value employees, try to provide a stable work environment, opportunities for growth and development, and share in the profit.

Profit - Achieve sufficient profit to finance company growth and achieve corporate objectives.

Principles - Operate according to biblical principles.

The major reason for the company’s success has been the extra attention it gives to its customers. Employees are committed to doing whatever it takes to keep a customer satisfied.

The Founder

Gary Vermeer, who founded the company in 1948, can be described as a man with a great vision. To justify his motto, “Find a need and fill it,” he has time and again gone to his customers to learn how a particular piece of equipment can be improved. This has earned Vermeer the reputation as a company that values their customer’s opinion and never stops learning.

The father of three, Gary made sure his children learned the values for which his company has stood for the last 50 years—innovation, customer satisfaction to the highest level, and taking care of the Vermeer family, its employees.

A farmer, inventor, entrepreneur, manufacturer, industrialist and a family man, Gary celebrated his 80th birthday last September with customers, distributors and employees, all of whom he regards as part of the big Vermeer family. Even today when he is not actively working at Vermeer, he goes to his farms to pick corn and finds great pleasure in using one of the machines he invented. “He is a simple, yet a very complex man, who never settles for average,” says Vince Newendorp, general manager of the environmental division. He demands excellence and has very high expectations. He is a tough man who built this company himself, without surviving much on loans, and did not let success touch his humility.”

“I did not have the privilege of working directly with Gary in my four years here,” adds Phil Smith, project engineer for tree products. “It amazes me that a company this size could be the brainchild of one man. I see a real dedication and sense the feelings the employees have towards him and his family”

His son and daughter, CEO Bob Vermeer and President Mary Vermeer Andringa, exhibit the same family traits. “We are going a step further by trying to get the grandchildren to work here at Vermeer, which would make sure the transition from the second to third generation would be very simple,” says Mary. “This
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is the way we can instill more confidence in the minds of our customers and distributors that we are a solid company, built to last for a long time.”

She defines the vision of Vermeer as:

**Lean culture** - Follow a single-file production plant, where each piece of equipment is produced with the least cost, while maintaining the highest quality.

**Best People** - Find people who have high character and can help us maintain our image.

**Innovation** - Keep looking for new ideas and constantly improve current products using feedback from customers.

**Sales & Service** - Provide the best sales force and service in the industry, which helps keep a customer forever.

## The Celebration

Vermeer inaugurated a new Global Pavilion during its month-long 50th anniversary celebration. The 75,000 square-foot facility holds a state-of-the-art training center with nine classrooms, an auditorium that can seat 96 people, and a display arena for their equipment that can accommodate up to 3000 people.

To kick off the celebrations, all employees were invited to the Global Pavilion to hear the story of Vermeer from the founder. More than 6,600 attendees were treated to a day-long event of fun, food and games. Separate days were held for the community and retired employees, past distributors and dealers, as well as their families. The road leading to the Vermeer plants was renamed Vermeer Road in the company’s honor. Following this, more than 800 customers, distributors and trade media participated in a three-day Equipment Conference, which included tours of the plants and hands-on equipment operation.

“The significance of such a big event is to show the industry that we are not like any other typical manufacturer, and we care for our customers,” says Kent Rotert, marketing manager. “This can be an extension of a post-purchase-perception idea, whereby we show customers that they are still remembered even after they purchase equipment. This kind of an event definitely changes the perception of the customer, who now no longer sees us as a big manufacturer, but a company that cares and values their opinions.”

Newendorp further emphasizes, “A show like this is to achieve a more personal relationship with a customer. We travel throughout the world meeting our customers and distributors, and this is a time where we can meet all those people together at one location. And getting that personal approach to the customer-manufacturer relationship gives a whole new character to the way we do business. It is an opportunity to show them what Vermeer is all about and the pride our employees carry on their shoulders.”

## The Employees

Vermeer employees are indeed motivated by working for a company where the future is bright and all efforts are being made to build that future.

“Vermeer means longevity,” explains Rotert. “There are some people here whose parents worked at Vermeer and hope that some day their children do the same. Listening to Bob and Mary talk at the celebrations, I have no doubt that this company will continue to prosper for another 50 years. If you are excellent at what you do, you are bound to grow.”

On my visit to the tree care equipment plant, the TG400AL tub grinder was enthusiastically introduced as the “Big Boy.” During plant visits, employees were keen to talk about their work and products. Chris Nichols, product specialist in tree products said, “If you work at Vermeer, you get a lot of respect, are considered solid, successful, and a great addition to surrounding communities.”

While employees consider themselves envos to the community, Vermeer’s dealer network acts as ambassadors in the industry. “We have a highly professional dealer network that feels the pulse of the industry and relays it to us so that we can start working on concerns immediately,” relates Nichols.

## The Industry

Vermeer depends heavily on feedback regarding their products. Its annual Equipment Conference brings customers to the corporate office for one-on-one discussions with engineers. This helps the engineers learn more about the demands of the industry and gives customer a chance to understand the technology behind a product.

Vermeer’s engineers are not scared of change, especially when suggestions come from their customers. “Each facet of the company is customer driven,” says Tom Ogle, product director for the tub grinder division. “Our R&D department uses the most advanced technology to develop new techniques and ideas to enhance each piece of equipment we launch.”

Feedback is encouraged at the Equipment Conference. Vermeer seeks comments from customers, who make valuable suggestions. Then engineers go back to their drawing boards and consider them. Many customers also ask “Why” and “How” questions, seeking to understand the technology behind these products.

Customer feedback serves more than one purpose. In addition to initiating ideas, it helps build relationships. “A customer who buys from us today may not buy for the next 10 years, but we are trying to make
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an effort to make sure that when there is a decision to buy, he or she buys from us," explains Newvendorp. "We believe that ‘Once a Vermeer customer, always a Vermeer customer,’ and we strive real hard to keep all our customers.”

One focuses for the 50th year celebration is giving back to community, the environment and the country. For example, last year there was major snow storm in the Pella area. The leaves were still on the trees when the storm struck, causing a lot of damage. Vermeer immediately sent out crews with equipment to provide help in five communities around Pella.

Vermeer has several tree planting programs underway, and a special tree planting event has been scheduled on the same day as NAA’s National Day of Service. Vermeer has donated trees in seven different communities in Iowa. "More important is the fact that we want to be a part of an outpouring of giving, since these are also the principles of this company,” says Nichols.

The Future

Bob and Mary Vermeer, their top management and all of the employees know exactly where they want to be 50 years from now.

Referring to a book “Built to Last,” Mary Vermeer explains why the company can be classified as visionary. She wishes to raise the company to a higher level where profits are not the only goal. “Short-term goals do not earn long-term benefits,” she says. “The core values of this company (people, products, profits and principles) should not be compromised for anything. We want to make profits, but we want to put them back in the company for a better tomorrow.”

Vermeer Manufacturing was recently honored with the Presidential E-Star Award for the company’s excellence in exporting. Specifically, the award recognized the company for successfully expanding into new market territories and dramatically increasing exports—in spite of strong foreign competition. Vermeer experienced a 55 percent increase in international sales over a three-year period from 1994 to 1996, compared to an industry-wide increase of 11 percent. International sales rose another 22 percent in 1997, and Vermeer is continuing its rapid growth in 1998.

The E-Star award dates back to World War II, when thousands of ‘E’ pennants were awarded throughout the United States as symbols of patriotism. The Presidential ‘E’ Award was created by President Kennedy in 1961 as the nation’s highest honor for outstanding performance in the global marketplace. Vermeer joined the ranks of the ‘E’ award winners circle in 1990, and is presently the only company in Iowa to receive the E-Star Award since 1990.

“My father has been the biggest inspiration for me, as we try to lead this company to the highest level of production, quality and perfection,” concludes Bob Vermeer. In today's age where change is the only constant and people talk about information superhighways, a family company in Iowa has shown that taking care of its extended family is the key for a brighter future.

Sachin Mohan is staff writer for TCI.
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By Don Dale

Bob Hansen looking over soil at a multi-million dollar landscaping project, for which he is consulting arborist.

Location, location, location does not only apply to real estate. It applies to trees, too. Specifically, a tree not located in appropriate soil is virtually doomed to a life of ill health and, more than likely, death at an early age.

This is an aspect of tree care that many otherwise knowledgeable contractors tend to ignore either in the planning stage of a new planting or the diagnosis stage of an old tree that is not thriving. Arborists can and should actively educate builders on proper soil preparation. Some soil specialists emphasize that a high percentage of tree
problems are a result of poor planting medium—which could have been avoided years before when the tree was being installed.

"The site is what it is, you can't change it." says George Schmitz, owner of Donald Eberhard and Associates in Los Angeles, a soil and landscape consulting business. "But there should be an examination of the suitability of the soils."

Schmitz has helped design landscapes all over the country, as well as correct long-standing problems with trees and turf. His specialty is providing good soil and soil fertility, and he says there is no substitute for both in the early life of a tree.

This opinion is shared by Tom Smiley, plant pathologist with Bartlett Tree Research Laboratories in Charlotte, N.C. He says it is necessary to analyze factors such as soil pH, cation exchange capacity, water percolation, soil bulk density and fertility before a tree species is even selected for a site.

"We recommend that everyone do it prior to planting," says Smiley. "Soil testing is not only the first step, it is essential."

Garn Wallace, owner of Wallace Laboratories in Los Angeles, notes it isn't always the obvious problems that are averted through good planning and soil testing. Disease and nutrition deficiencies may be the least of a tree planter's worries in California. He always stresses that contractors should analyze before they plant.

"The major problem here is over-fertilization that becomes toxic," Wallace says, describing the primary cause of tree dysfunction he sees in urban areas.

A contractor who plants a tree on a site that has been over-fertilized for years, either through agricultural or homeowner zealously, can have a higher chance of loss than a contractor whose trees are planted without adequate fertility. The only way to spot those problems? Chemical testing.

From soil toxicity to poor drainage, early testing and soil amending are keys to providing good tree establish-

ment from day one, Wallace notes. It is only then that factors such as nutrition and irrigation come into play.

"We are generally in a cut and fill situation," Wallace says of new planting sites. "Our soils are infertile, perhaps high in salts and probably highly compacted."

Building contractors in urban areas often over-compact a construction site in order to avoid any future problems with settling, and Wallace says the soil is often rock-hard. He likes to go to a site and look for vegetative growth that has germinated. If there's none, that is a good clue that topsoil is thin or nonexistent. Wallace samples the soil in the top foot, and then at a depth of two or three feet or deeper, trying to get a soil profile.

Schmitz adds that on one job—where palm trees were going to be planted at a parking lot site in compacted, silty soil—he had earthmovers dig a pit 10 feet deep so he could get down in it and view a cutaway of the soil.

"Because of that, we could see where we had to go to get below the impervious material," Schmitz recalls. He and a colleague designed a back-fill mix. Ten years later he went back, and the palm trees were thriving in the parking lot.

Part of the reason they thrived was that Schmitz also tested the soil for water penetration, and designed a drainage system when he found drainage inadequate. All the parameters of a soil can be tested, and adjustments can be made if necessary.

"We would come in with an import soil that would be suitable for the site," Wallace says, referring to situations where existing soil was not conducive to root growth. He prefers digging a hole in a bowl shape, deep enough for the root ball but two or three times as wide as the ball to allow for lateral root expansion.

Soil amendments, where necessary, should be made not just around the roots...
Garn Wallace, a soil consultant looking over one of his former landscaping jobs.

but out to where the tree’s eventual drip line will be. Fertility is often overlooked. Wallace cautions, because non-arborist tree installers often have the misconception that trees like infertile soils.

“We find these fertile islands under each plant,” Wallace says of his research into native tree fertility. He did work on a nuclear test site in Nevada and found that even trees growing under those conditions created islands of fertility, primarily through leaf drop.

So Wallace Laboratories likes to give a tree a head start by giving it a fertile island at the beginning. He tests the soil for 14 elements, from calcium to manganese, then adds any deficient elements.

“In addition, we test for heavy metals to see if the soil is toxic,” Wallace says, pointing out that he has found odd toxic materials such as cadmium and vanadium from natural causes. “We found vanadium at one site that was through the roof.”

Other naturally occurring materials, such as sodium and magnesium, should also be monitored, but what to be alert for varies from one geographical region to another. Magnesium is often in oversupply in California, but could be in short supply on the East Coast. Yet, within one county there will be wide latitudes of soil conditions. That’s why testing is critical.

Micronutrients, such as copper and zinc, are important in the amendment mix, Wallace insists, but he warns against overdoing them. They can be toxic, too, in heavy doses.

Soil pH is another important test element, with different tree species liking different acid balances. Amendments such as gypsum, limestone and dolomite can be used to balance pH.

Wallace adds that the quality of fertilizer added to a tree well is also important. He recommends fertilizers with slow release and low salt index.

Smiley also recommends testing and using amendments where required be-

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Even on one site we may have one area of the property where there’s good percolation and drainage and another area where there’s 10 inches of good soil and sandstone below that ... Maybe the biggest problem is that there isn’t any uniformity in the soils ... The more I see, the more I believe it—a soil test is required before any trees are planted.

Salt is another problem that is common. It is not only toxic in high doses, but it also causes compaction and poor drainage through its reaction with the soil.

Smiley relates that Bartlett—which has a new prescription fertilization program designed just for this reason—uses a commercial testing lab and recommends them highly. But he says that in some areas university extension services will do testing for arborists.

Like the other experts, Smiley highly recommends that a percolation test be done to see how well the soil drains. It does no good for a tree to be given a good growing medium with lots of nutrients, then die after the first heavy rain.

It is also important to make sure the tree you plant has an adequate root ball before putting it in the ground. A nursery may have re-containered the tree but added inappropriate soil that will eventually stunt the tree’s growth. Other planting rules still apply, even if the soil is good. For example,

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“We’ve found about 25 percent mortality from that,” Smiley says of research his company has conducted on the East Coast.

Schmitz admits that all this testing may seem unnecessary and costly, but he relates what one old-timer, and very experienced tree man, told him: “If you show me a sick tree, I’ll show you a poor soil.”

One of the most experienced arborists in the Los Angeles area with over 40 years experience, Bob Hansen, agrees wholeheartedly with all of the above. Bob Hansen Tree Preservation of Santa Monica has a policy of testing all soils where trees will be planted.

“Even on one site we may have one area of the property where there’s good percolation and drainage,” Hansen says of the drainage issue, “and another area where there’s 10 inches of good soil and sandstone below that.”

Soil quality is also dicey, especially on new construction sites in the hills, where terracing, topsoil removal and compacting can create a deadly soil situation. An arborist is faced with a scary planting medium.

“Maybe the biggest problem is that there isn’t any uniformity in the soils,” Hansen notes. “The more I see, the more I believe it—a soil test is required before any trees are planted.”

A job is too risky, for the plant and the tree installer, without soil testing. Hansen has seen a single tree that cost $35,000 to move and plant. If it dies, somebody will pay. He has one job now as a consulting arborist that has a “multi-million dollar” landscape contract, and he oversaw the planting or moving of hundreds of trees up to 30 inches in trunk diameter.

“There was only one fatality of a tree
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being moved in,” Hansen notes with pride, and that one simply got moved around too much. The high success rate was partly due to the fact that he recommended “well over a hundred” soil tests as well as extensive drainage planning and implementation.

At $70 per test, that added up to some money. But in his mind, it beats having to redo the job.

Wallace recalls a job where a few soil tests could have saved a landscaping project that completely failed after five years. That cost a quarter of a million dollars to redo. A housing development he knows about stalled for years because the contractor could get no trees or shrubs to grow on the property. After proper soil treatments, the trees and sales took off.

“I’ve heard arborists say they can feel the soil and tell you what it needs,” says Hansen, an NAA member. But, he adds, he can’t. And none of the experienced soil specialists he knows can do it, either. The soil may look good, but have an over-fertility problem. Adding more nutrients could have a severe negative effect on any tree planted there in a short period of time.

“The soil is analyzed now before it’s fertilized,” he emphasizes.

All species of tree are susceptible to problems of soil quality or soil structure, but some are more susceptible than others. Hansen has found that on the California coast, for example, oaks, sycamores and magnolias are particularly sensitive to soil problems and should be accorded exacting soil testing.

Plant disease often arises from problems with the soil, not the tree itself. Poor drainage—which is easily ascertained by a percolation test that the arborist himself can do—is a disease inducer of the highest order. Poor soil structure, leading to anaerobic conditions around the roots, is another.

“It’s estimated that 90 percent to 95 percent of a tree’s absorbing root system is destroyed when it’s boxed,” Hansen says. Thus a transplanted tree, much more than an existing tree, needs to have high-quality soil awaiting it.

Finally, Wallace touts plant tissue analysis as a further means of soil testing. If a tree or shrub already lives on a proposed planting site, its leaves can be analyzed for a range of elements. Those include nutrients and toxic elements such as nickel and cadmium. Tissue analysis in combination with soil testing can really provide accurate information about an installation site.
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If your metal fenders not looking so hot due to dents or rust, stress cracks, you will want to view the Minimizer’s new multiple-axle fenders. Capable of covering multiple axles in one continuous span or each axle individually, they are made of high-density polyethylene material that is impervious to chemicals, heat, cold and dings. The fenders also incorporate the light bar into the fender as an option. The plastic fender, pioneered by Spray Control Systems, Inc. (SCSI), is made of molded plastic that won’t dent like traditional steel fenders, because it will pop back to its original form. The fenders come in four colors: black, white silver-gray and red. Custom colors available on fleet orders. The Minimizer line also has a range of mounting options available from stainless steel to composite plastic brackets. For more information, call 800-248-3855.
Two new Strato Charged Air Head engines by RedMax have been certified to meet both Environmental Protection Agency (EPA) and California Air Resources Board (CARB) tier 2 standards. These 34 cc and 25.4 cc engines are the first two-cycle engines to meet the stringent California standards without a catalytic converter. The engines, which will be offered next year in the company's model year 2000 handheld equipment, weigh five percent less and are 30 percent more fuel efficient than current engines have THC emissions reduced by 73 percent. The engines also meet EPA and CARB II standards for CO and NOx emissions, yet retain all the advantages of the two-cycle engines. For more information, write to RedMax / Div. Of Komatsu Zenoah America Inc., 1505 Pavilion Place, Suite A, Norcross, GA 30093. Phone: 800-291-8251, ext. 29 or fax: 770-381-5150.

Bandit's popular Model 1890 Intimidator—an 18-inch diameter capacity hydraulic feed, drum-style chipper—has recently undergone two major improvements since its introduction just 18 months ago. First, the pocket that catches the chips as they come off the knife has been enlarged, increasing carrying capacity and throwing velocity. The larger pockets are very crucial in insuring that chips are discharged on the first pass and not allowed to remain in the chipper housing. The second major improvement is a "power slot" cut in the belly of the chipper. This allows for the proper flow of air through to the discharge and provides a slot for chips that might remain in the housing to discharge. This particular design change makes the 1890 virtually impossible to plug. For further information or to arrange a demonstration, contact your local dealer or Bandit Industries, Inc. at 800-952-0178.

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New GM at Vermeer

Vermeer Manufacturing Company has named Vince Newendorp general manager of the Environmental Division.

Newendorp oversees all business functions for the division, including engineering, manufacturing and parts. He started with the company in 1977 as a design engineer, and has held several positions in the area of product development. He was most recently product director for tree products, prior to becoming General Manager of Environmental. Newendorp is a member of the board of directors of the National Arborist Association. A graduate of Iowa State University, Newendorp and his wife Monica currently reside in Pella with their three children.

Bandit Dealers Meet

Bandit Industries, Inc.’s third dealer meeting attracted over 54 dealerships from across the United States, Canada, Japan, England, Australia, Holland and Poland.

Bandit hosts a general meeting at the home office every three years in an effort to train and educate Bandit representatives. Training was the primary focus of the meeting. Dealers attended sales, marketing and parts and service seminars.

Forestry Equipment Expands into Virginia

On August 15, 1998, Forestry Equipment of Shelby, Inc. (FES), announced the opening of its first sister company operating under the name of Forestry Equipment of VA, Inc. (FEVA), formerly known as the Asplundh Tree Expert Co.’s Forest, Va., manufacturing facility. The newly acquired, fully equipped facility with over 42,000 square feet is located on 14 acres in Bedford County, Va.

The Virginia facility will offer chippers, bucket trucks and specialty equipment—including aerial-mounted skidders, 4WD puddle jumpers, elevator aerial trucks and more. Forestry Equipment of VA, Inc.’s center will provide:

- Certified Welding
- Certified Aerial Lift Service and Repairs
- Customized Mounting of Aerial Devices on Specialty Carriers
- Hydraulic Component Rebuilding
- New and Remanufactured Replacement Parts
- All installations to new cabs and chassis are certified to meet all applicable Federal Motor Vehicle Safety Standards, ANSI Standards and OSHA requirements.
- Rebuilds and Repairs of Chippers
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- Full Service Body and Paint Department Featuring Large Drive-Thru Paint Booths
- Dielectric Testing and Certification (In-House & On-Site)
- Detailing to Customer Specification

Both companies will be able to offer arborists a full range of new and used equipment at both their Shelby, N.C., and Forest, Va., locations.
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Recruitment in the ’90s and Beyond

By Richard Jones

To expand your business in the future, you need good employees. While finding exceptional employees has never been easy, ten years ago tree care companies had a much easier time. Things have changed quite drastically with the expanding economy and fewer young people entering the work force. At Davey Tree Expert Company, we are constantly looking for people, and we often have more than a hundred openings available at one time.

Our industry, and the American economy as a whole, is faced with a declining pool from which to recruit. Before, people would come to the door, and you could choose. Now, you have to go out and actively recruit. There is almost no unemployment in many parts of the country today.

There are four things you should consider as you work with potential employees.

1. Finding employees
   They won’t come to you any longer, so you better figure out how to find them.

2. Interviewing and selecting
   Learn to select the right people. Too often, you hire people who quit by lunch. You waste too much time on people you never should have hired in the first place.

3. Orientation of new hires
   It is important to treat a new employee correctly from the first day. Be prepared, so that employee is prepared to work. If you don’t have an orientation process in place, you could turn off a very good person.

4. Ongoing relationship and education
   Once you have a good employee, how do you keep him enthused for the next 30 years? It wasn’t always necessary to worry about an employee’s happiness. If an employee left, there was always someone there willing to take his place. It is more important than ever to hold on to quality employees.
1. Finding employees

We took a survey of employees at Davey to discover what kind of people work for us. We found out the following: They are in their 20s; have a high school education; have not yet started a family; they smoke but are not heavy drinkers; they spend leisure time outside; and they have little experience working with teams.

What that means for you as a manager and a company owner is that you have a generation and a perception gap between you and your employees. The working world that existed when you started your professional life is not the world of your potential employees. I have five children, one of whom is in the tree business. He reacts completely differently than I would to situations he encounters in the tree business.

You are drawing employees from a work force that has little experience working on teams. This is interesting to keep in mind, because you expect them to perform as part of a team every day.

If most of your employees have no experience as team players, you will have problems.

How do you attract applicants? At Davey, we hire a lot of people brought in by our present employees. You probably do, too. Present employees should be a good recruiting source. They can also be a source for bad recruits, of course, if they are the wrong type of employee and they refer similar people. Start close at hand by letting employees know that you welcome referrals.

Once in a while, we advertise in the newspaper—though the results are generally not encouraging. A better idea is to visit the high schools in your area. Kids today don’t know we exist. It’s fun to work with kids—they bring a level of enthusiasm you don’t see every day. Most of us like to talk about what we do, and kids want to hear it. Pass your knowledge and enthusiasm on. In some schools systems now, students are being asked to look at what they want to do for a career as early as the seventh or eighth grade. By their senior year, if you haven’t introduced your profession, it will be too late. Go out and visit is a high school or vocational school near you. They all have career days. Last year, I went to a local school to speak at a career day. The first group numbered 6, the second group increased to 25, and third group couldn’t fit in the room. Four of those kids graduated and applied to work for us. There’s no reason why you can’t do the same thing.

One important point you should always stress to these kids is that if they want to work in the tree care business, and a lot of other businesses for that matter, they will need a clean driving record. If they need a CDL, they will be drug tested. At times we needed to hire a lot of people at once. We selected 100, and when we scheduled them for a drug test only 50 showed up.

We all should be doing something out in the community to show people we exist. Active outreach efforts promote our businesses, and introduce people to our profession. If you didn’t participate in an Arbor Day activity last year, you should
We always mention Arbor Day, but that’s only once a year. Seek out other opportunities for contact and promotion the rest of the year.

What sorts of things can you do? Go to the schools and teach them how to plant a tree properly. You might even plant a variety of trees, so the biology teacher could use your work for a tree identification lesson. This will help get kids interested in agriculture and natural sciences. Become involved in other youth organizations, such as Boy Scouts, Campfire Girls and Future Farmers of America. And if you don’t have the time to make every speech, or if you aren’t very good at talking to groups of people, send an employee.

Get involved, promote your industry—you will influence people in a positive way and thereby attract them to your industry. Don’t wait for the NAA or ISA to do your job for you. Those organizations might provide literature to help you, and they have a joint pamphlet called “Careers In Arboriculture.” But if you don’t get those brochures into people’s hands, they are wasted.

Our industry has to attract people who want to work outside, maybe get a little dirty. Our industry won’t appeal to those who want to sit in air-conditioned offices working as lawyers or computer operators. Your competition is from other industries that draw kids who want to be outside or work with their hands. Find them everywhere you can in schools, bars, the weight room at the local gym.

Back in the ‘80s, I used to do a lot of CETA training, which was a federal job-training program. Keep alternatives like this in mind. Halfway houses, prisons and other programs are training people in arboriculture. Ohio has a school-to-work program where high school students can earn credits by going to work.

Another way to attract people is to keep your current employees happy and motivated. If they are excited about working for your company, they will tell their friends and colleagues: “This is a great place to work, you should apply here.” Let your employees do your initial recruiting for you.

When do you look for employees? When you need them or when you get desperate? You should be looking all the time. If a good prospect comes in, hire him if you can afford it. A good prospect will find another job fast.

2. Interviewing and selecting

Ideally, you would select people who are physically capable of performing the work. You also prefer people who are mechanically inclined. You may go to schools and visit the horticulture class, but right next door may be a shop class filled with people who are mechanically inclined. Talk to those kids about getting into your business.

You are looking for people who can

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work independently, and you want, paradoxically, people who are team players. If part of your business is spraying and you have a crew of one, you want someone who can work independently. At the same time you want a crew of three to work together well.

In selecting new people for your business you want to hire people who already know how to use all of the equipment, but most of the time you are trying to show them how to use the clutch. You would love to hire a person with three year’s experience who has already been trained—especially when you just lost someone who you trained.

At Davey, we look for people who are able to be trained. Even if people come with experience, they were trained by someone else and we’re not too sure how much they really know. Sometimes their training taught bad habits and we have a difficult time overcoming years of bad habits.

The most important attribute in selecting the right person is attitude. You can teach every skill associated with arboriculture, but you can’t radically change a person’s attitude. You may be able to influence someone’s attitude—for a short period of time, but a bad or dishonest character generally stays that way for life.

A person’s attitude toward life can change, especially as they mature. An irresponsible kid right out of high school can grow up to be a good employee. If an employee gets married, for example, he will start thinking more about responsibility. Sometimes the light bulb does click on.

Before you spend time and money interviewing, drug testing and training new employees, you want to be pretty sure that person has the right work attitude. That’s what a proper interview is designed to discover.

After you know what type of people you want to select for your company, it is critical that you get the interview process right. When an applicant comes in for an interview, what does he see in your office. Is it a junk pile? Is the phone ringing off the hook? Are you yelling at your current employees while interviewing the applicant?

Don’t let this happen. The person you are interviewing is interviewing your company at the same time.

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Don’t let this happen. The person you are interviewing is interviewing your company at the same time.

The physical setting is very important. You must be ready. A qualified applicant walking through your door is the most important customer you will talk to that day.

Part of the interviewing process is knowing what you expect from an employee and what that employee expects from you. You want honesty, loyalty, promptness, neatness, common sense, commitment for long term, hard work and an ability to listen.

How do you discover whether or not an applicant has those qualities? You need to ask questions to find out. Don’t ask yes or no questions, and don’t spend the entire interview talking. Let the applicant talk.

We tell applicants that we work anywhere from eight to 12 hours a day ... whatever it takes to get the job done. An
applicant who wants a job will say, “fine, I can do that.” People will agree to most everything to land a job. Dig deeper and explore a person’s attitude.

There are questions that will help you evaluate a person’s attitude and personal qualities. Ask behavioral questions, such as how they reacted to situations in the past. This will help you find people with the right attitude. Past behavior is a good indicator of future behavior.

Don’t give people theoretical situations. Ask about real life. For example, “Did you ever have a conflict with a boss? How did you handle it? Have you ever been in a fight. Why? How did you handle it?”

If he solved the situation by decking his fellow student, he might handle a confrontation with a customer the same way. Granted, we want some aggressiveness in our employees, but not quite that aggressive.

Finally, keep good records, because once you interview a few people, and a few days pass, you won’t be able to keep things straight. Have your questions ready beforehand. You should ask every applicant the same questions. Otherwise, you can’t compare skills and attitude.

Most employers ask for references, but a surprising number never bother to call and check on them. Make the call. If you are hiring kids right out of high school, check school attendance records. They might not have much of a work history, but many have worked at some time.

3. Orientation of hires

Everyone remembers the first day on the job. Nobody remembers day 212. Do you have an established orientation process? If not, have you ever hired someone who didn’t come back for day two? That’s your fault.

Be prepared for that new hire. First, tell the rest of your employees that someone new will be starting. Have equipment out and the necessary forms ready for a signature.

New hires need to spend the first day learning the rules of operation—what to do if the weather is bad, etc. Don’t just introduce them to their foreman and send them out into the field. You can’t expect people to follow company practices and procedures if they don’t know what they are.

You have to explain what you may think are basic pieces of information... the truck takes diesel not unleaded... call the office if you’re sick...

I know you are busy running your company and you can’t always take time to explain how your company works to every new hire. But it is vitally important that employees get off on the right foot. If you adopt a sink or swim orientation attitude, then some who would eventually become good employees will sink. Others, with experience and knowledge of how a tree care company should be run, will take an immediate, negative view of your company’s management style.

So take some time to make new employees aware of company policies and procedures. Help them understand what is expected and how they can turn a job with...
4. Ongoing relationship

I always tell our employees, “I hope you come to work for us at 18 and retire at 85, with all your fingers and toes attached. We want you to work in a safe environment with the best equipment we can afford and promote you while increasing your abilities.”

In surveys of employees, we asked why they decided to leave. Equipment was a main focus, and money played a role, but the foreman was the primary factor. People who left cited a bad foreman, whereas satisfied employees who stayed all said good things about their crew leaders.

These are the reasons people stay: job satisfaction, stability of work, quality of equipment, better and safer techniques. People’s commitment is to the tree care industry, rather than to an individual company. If you ongoing relationship with employees isn’t functioning, they will move on.

Another thing that encourages people to stay—and helps your business in the long run—is a commitment to training. A well-trained crew works more efficiently and more safely. And if your employees know you are committed to increasing their skills, they will be more likely to stay. They know that more skills and knowledge means a better job, as well as a better chance for job security.

Another interesting feature of the survey was that everyone we hired expected hard work. People would leave for more money or a job closer to home, but rarely due to the rigors of the job itself.

Why did they come to work specifically for Davey? A friend worked for us, they needed a job and they wanted to work outside. Those are the kind of people you should be looking at for new employees.

Conclusion

Attitude is the key to recruiting the best employees in the ’90s. You can train anyone, but you must find people with the right attitudes. Recognize that you have to change with the times as you look. A few years ago, our work force had a lot of folks with high school diplomas or lower. Now, many have some college and more have degrees in their field. As a result, we expect more from our employees—certification, pesticide license, DOT regulations—and they expect more from us.

Fortunately, we work in a great profession. One of the most attractive features of this industry is the people who work in it. Sell your profession to the people outside of it. You can place a Help Wanted ad when you need a new employee, but not many people know what an arborist does. Sell your industry in a positive way and people with positive attitudes will make their way to your door.

Richard Jones is manager of training and education services at the Davey Tree Expert Company in Kent, Ohio. This article was excerpted and adapted from a lecture at TCI EXPO ’97.
The NAA has been arguing stridently against the inclusion of the tree care industry under the umbrella of Logging Standard regulation ever since that standard’s promulgation several years ago.

In late summer 1997, officials with OSHA’s Directorate of Compliance Programs promised to provide the NAA with written documentation that the tree care industry was considered exempt from the requirements of the Logging Standard. Coincidentally, there were 13 citations upheld against employers in SIC 0783 for violations of the Logging Standard between October 1996 and September 1997.

Shortly thereafter, the long-awaited letter was issued, only it stunned the industry, because it offered the opposite of what had been promised: inclusion rather than exclusion from regulation.

There was outcry from the industry and the threat of legal action against OSHA. The actions of the Department of Labor came under Congress’ scrutiny through Rep. Cass Ballenger, chair of the Subcommittee on Workforce Protections of the House Committee on Education and the Workforce.

On July 1, 1998, OSHA’s Director of Directorate of Compliance Programs issued a memo instructing OSHA field offices to not issue Logging Standard citations (29 CFR 1910.266) to employers in tree care, “... who are not engaged in logging operations”—at least without OSHA headquarters approval.

The memo notwithstanding, OSHA recently initiated two separate “logging standard” prosecutions in New York and Alabama against tree service companies engaged in routine line clearance operations, despite the fact that the operations were covered by OSHA’s Vertical Standard, 29 CFR, 1910.269.

In an Aug. 28 meeting with OSHA’s Acting Director of Compliance Programs, the NAA was assured that these prosecutions would be withdrawn pending a meeting to try resolving the issue through discussion rather than litigation.

On Sept. 8, prior to the aforementioned meeting, NAA’s legal counsel was advised by OSHA that it was proceeding with both prosecutions, despite earlier promises.

On Sept. 29, 11 representatives of NAA member firms, its officers, Governmental Affairs Committee, Safety Committee and staff met with 12 representatives of OSHA, with the Logging Standard controversy foremost on the agenda. Both sides agreed to continue the dialogue, to research the issue exhaustively, and to try to reach a cooperative, rather than litigated, solution.

Both sides will be analyzing in detail the 68 fatalities that occurred in SIC 0783 in 1997, with the hopes of better understanding and mitigating the underlying causes of the accidents. Both sides will be making side-by-side comparisons of the Logging Standard (29 CFR, 1910.266), the Vertical Standard and the ANSI Z133 standard to uncover possible gaps, overlap and conflicts. There will likely be a follow-up meeting of OSHA and tree care industry representatives toward the end of the year.

The hot buttons in the Logging Standard are its two-tree-length-when-felling rule and its chain saw protective apparel rule. Current tree care industry standards recognize that sometimes, because of physical restrictions of the site or other requirements of the felling procedure, it isn’t possible for a crew to be two tree lengths away when a tree is being felled. Those standards offer alternative work practices that allow the work to be completed safely. The current tree industry standard clearly focuses on safe work practices to avoid an accident, and leaves more to the employer’s and employees’ discretion in determining what personal protective apparel is appropriate to the work situation.

The Deputy Assistant Secretary of OSHA stated at the outset of the Sept. 29 meeting that one of OSHA’s goals in this cooperative effort is to significantly reduce the number of fatalities in SIC 0783 in the next few years. Certainly, though there is disagreement on the means, this is the end that both sides hope to achieve.

Peter Gerstenberger is the director of safety and education for the National Arborist Association.
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Dealing with personality conflicts in a normal business is tough enough. It’s worse, however, when dad, mom and the kids all work in close proximity. Resentments and misunderstandings that are not addressed at home remain unspoken at work. At best, these emotions distract everyone from business affairs. At worst, they erode the bottom line and destroy the business. Here are solutions to the most common—and costly—problems encountered by families who work together.

When mom, dad and the kids start their own tree care company, sheer enthusiasm keeps the business growing ... for awhile. Too often, though, there are problems below the surface growing from the resentments and personal agendas that family members bring with them to the workplace. And when parents and kids deal with personal problems instead of business affairs, the non-family staff blames every problem on nepotism. In this article, seven family business consultants show how to keep common problems from turning a scenic tour into a wreck.

Problem 1

Now that your daughter has proven her management skills at another employer, you want her to take a top position at your business. But you are afraid to alienate your veteran non-family managers who may want the job.

Your managers have invested years building their skills at your business. So now they have to report to somebody who gets her job because she’s family? That could create an attitude problem, not to mention costly defections of quality people.

You can solve this problem with a good communications strategy, says Paul I. Karofsky, director of the Northeastern University Center for Family Business in Dedham, Mass., a membership-based educational forum for families working together.

Karofsky suggests a three-step approach.

Step 1. Interview all the players and ascertain their feelings about the expected appointment. “Have open discussions that clarify the company’s policy and your entry criteria for family members,” suggests Karofsky. Emphasize that family members must jump higher hurdles. “It is extremely important that family candidates be more...
qualified than others for a position.”

**Step 2.** Demonstrate the need for the position that the daughter will fill. “If it’s not a demonstrated need, you are asking for resentment,” says Karofsky.

**Step 3.** Break the ice by getting your daughter to work with others right away. “Create project task forces which would require the interaction of your daughter and key non-family employees to help build relationships,” says Karofsky.

**Bonus tip:** Maintain a continuing dialog among top managers regarding family business dynamics, emphasizing that family members are respected not for who they are but for how well they perform.

### Problem 2
You feel a longtime, trusted employee would make a great coach for your child, but you are afraid the employee might feel intimidated. No one wants to train their replacement. That goes double for a career employee who may feel trapped by your request for stewardship.

“Unless they are incredibly mature, any employee would feel threatened about training a next generation family member,” notes Nancy Drozdow, principal at the Center for Applied Research in Philadelphia, Pa. “It’s natural for them to ask, ‘What does it mean for me?’ The solution is to put your employee’s fears to rest by talking about the subject.”

Communicate your admiration for the employee’s skills. Emphasize that your son will be working in another capacity at the business. “If you plan for the second generation to take over the business, provide a time frame,” suggests Drozdow.

**Bonus tip:** Consider assigning a coach from outside the business. Work out a “mentor exchange” with another family business in your area.

### Problem 3
Your daughter wants you to sell the business at a discount price to her husband, who has been working at your business for many years. This situation, in colorful variations, is as common as it is tricky to solve.

“You need to answer three questions when approaching this issue,” says Mike Cohn, president of Cohn Financial Group in Phoenix, Ariz. Let’s tackle them one at a time.

**Question 1:** What’s the real value of the business? “Has an outside appraiser determined fair market value?” asks Cohn. If not, you don’t know what a reasonable “discount price” is.

**Question 2:** What do mom and dad need to retire comfortably? “Will the first

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**TREE CARE INDUSTRY - NOVEMBER 1998**
generation need continuing income from the business?” poses Cohn. Money from a sale may not be enough.

**Question 3:** Are the parents ready to let go? “Are Mom and Dad psychologically ready to relinquish control of the business?” asks Cohn.

Next, turn to issues of promises and expectations. Are there any grounds for selling the business at a discount, other than from the goodness of your heart? Perhaps the founder has promised to let the second generation have 10 percent of the business in exchange for sweat equity. Consider, too, whether the son-in-law was paid a fair market salary during his years at the business. Often family businesses will underpay the second generation, with the assumption that ‘some day this will all be yours.’ The difference between actual pay and fair market pay could determine a discount.

**Bonus tip:** Make sure your transition plan accounts for the disposition of the business in the event of a divorce between your daughter and son-in-law.

**Problem 4**

Family shareholders not employed by the business are questioning too many of your decisions in an effort to protect their dividends.

Pay dividends ... or re-invest cash in the business? That is the question. And people who are not on the business scene day-to-day can get quite nervous about risky but necessary initiatives.

Solution? Clue ‘em in!

“Even if management is making wise decisions, outside family members need to feel they are part of the business,” says Peter Baudoin, a Lafayette, La., family business advisor who hosts a radio show on the subject.

Baudoin suggests providing three things:

1. **Information.** Educate outside family members about what is going on. Informed individuals feel more in control of their destiny.

2. **Guidance.** Establish policies about which family members can participate in the business. Note that any
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95-2177 1982 Ford F700 gas chassis, 5-speed, hydraulic brakes, with an Asplundh LR-50 (826785) 55 ft. working height behind cab mount, pony motor, dump body, one-man side-mount platform. Aerial has been refurbished and is RTW status. $34,000.00

95-2076 1991 Ford F800 diesel chassis, 5/2, with an Asplundh LR50 (910125) 55 ft. working height, overcenter operation, lower boom insert, mounted behind the cab, full line body. Aerial has been refurbished and is RTW status. $52,500.00

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family member who wants to apply for an open position must meet certain experience and education hurdles.

3. Liquidity. Provide a vehicle for selling out shares in the business. "A dissatisfied family member with two percent of shares should have a way to sell out," says Baudoin.

**Bonus tip:** Establish a family council, comprised of family members inside and outside the business, to review business results and decide how much cash to distribute as dividends to non-employed family members.

---

**Problem 5**

You feel it's time to pass the management torch to the second generation. Problem is, several sons and daughters, now in their 40s, want the president's chair.

Time to bite the bullet and name a successor, even if you anger some of your sons and daughters, says Robert O. Middleton, a partner in the Chicago law firm of Nisen & Elliott.

"The patriarch or matriarch should decide on a succession plan, communicate it to everyone, and supervise its implementation," he says.
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transition,” says Middleton.

This solution is attractive because the second generation will readily fall in line with what the founder decides. “There is a heritage established: people understand ‘this was the founder’s wishes,’ and forward they go,” argues Middleton.

Nonetheless, rough waters lie ahead. “Some sort of sibling competition inevitably gets uncorked once the parent steps away,” admits Middleton. “The new leader will not get the unquestioned respect, obedience and loyalty that was granted the founder.”

Bonus tip: Avoid retaining business ownership after transition. Your successor needs the power that comes with ownership of voting stock—balanced by a controlling authority such as a board of directors.

Problem 6
Your son, starting to work at your business at age 16, wants to be treated like everyone else. But employees treat him with kid gloves and that makes him uncomfortable. Your son should approach this problem on two fronts, according to Susan Lazar, president of Susan Lazar Consulting in Minneapolis.

First, go beyond the call of duty in work habits. “Your son should work hard to do what is asked of him and avoid anything that would lead people to the conclusion that he is demanding special treatment in how he is assigned and completes responsibilities,” cautions Lazar.

Second, he needs to interact properly with fellow employees. Says Lazar: “Hang out with other employees at lunch time. Be careful to never
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TREES CARE INDUSTRY - NOVEMBER 1998

Problem 7

Your sons and daughters seem to be rebelling against what they say is your authoritarian-type rule. Whenever you turn around they seem to be circumventing your orders.

This scenario is typical of communications breakdowns in family businesses, according to Aron Pervin, present of Pervin & Company, a family advisory in Toronto, Canada. “Families rely on ambiguity in home life,” he says. “They are reluctant to be clear when they communicate, because they have the fear of not being loved.”

When this attitude carries over into the workplace, individuals behave in destructive ways to express feelings that they could not vocalize. In this case, the children were building up tremendous resentment that they were afraid to communicate to their dictatorial father.

“A family cannot start fresh when they move to the workplace,” cautions Pervin. “Family members bring along their old wounds and resentments.”

Pervin says the solution is to work out all the expectations that each family member has of others. “Encourage each family member to discuss recent critical business incidents that caused them to feel anger or resentment. Encourage them to express their feelings. Side-stepping issues rather than dealing head-on in a respectful, caring and fair manner is tantamount to a death knell for the family business,” he advises.

Bonus tip: If the patriarch will not change his oppressive style, hire a non-family manager as a buffer between the father and the second generation.

In this article, experienced family business consultants have given some real-world advice on solving seven common workplace conundrums. Follow their advice to keep your family business express chugging merrily over hill and dale.
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continued on page 68
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Beware the Lerp Psyllid!

By John A. Stepp

It was another early, beautiful September day, the air was crisp, cool and blue. Driving an orange pickup past the beautiful Santa Cruz mountain range, I looked over my inventory of trees.

The lerp psyllid is a new type of eucalyptus psyllid in California. It feeds by sucking the juices from leaves.

Psyllids exude "honey dew" (excess sugars), which cause sooty mold on leaves.

Eucalyptus psyllids are recent introductions from Australia and New Zealand. Lerp psyllid is causing foliage stippling, necrosis and defoliation on red gums in California.
During my 20 years as an arborist for the California Department of Transportation in Northern California, I’ve developed the habit of noticing trees. My wife says I do this wherever we go—parks, the seashore, friends’ yards. I guess that caring for and about trees is a hard habit to break.

I sped past dark green California live oaks, tall stately coastal redwood trees, and big sycamores with their wide maple-like leaves and mottled, beige bark. Along the shoulders, among the grey-green foliage of silver dollar eucalyptus trees, I noticed that the scattered red gums didn’t look quite right. Here and there, I noticed distressed looking red gum eucalyptus all the rest of the way to my office.

Outside of the office, I gathered leaf samples from some red gums. The leaves were coated with “honey dew,” an excretion from some type of sucking insect. Dark patches of sooty mold fungus had begun to grow on the sticky honey dew.

Some type of sucking insect was attacking my red gums! The only problem was, I had never seen or heard of such a thing. In my experience, eucalyptus trees are relatively pest-free in Northern California. This was a mystery!

I spread the affected leaves on the hood of my pickup, and took some closeup photos with a digital camera. The ten-power zoom lens revealed some strange-looking tiny, white, conical structures. They adhered randomly on both sides of the leaves, and looked suspiciously like scale insects. I wasn’t convinced, though. I’d never heard of any scale insect attacking eucalyptus trees.

It was time to get out the microscope! Under higher magnification, I found scattered groups of silvery looking spindle-shaped egg cases. The silvery egg cases all had a vertical split along their length, which showed that nobody was home.

Rotating the leaf slowly under the microscope lens, eventually some occupied eggs came into view. The Larvae inside the translucent egg cases were clearly discernable; abdomen, legs, head and a pair of tiny bright red-orange eyes could be easily seen. The developing larvae imparted a beige yellow-orange color to the silvery egg cases.

“Maybe I can find an adult,” I thought, and placed another specimen under the microscope. Eventually my search was rewarded, and a tiny red-eyed, translucent creature seemed to be staring back up at me through the eyepiece of my microscope. The tiny insect was latched
onto the eucalyptus leaf with its sucking mouth parts, and wriggled its abdomen from side to side as it fed. Internal organs shown through its transparent skin. I could see the heart beating, and the tiny gut expanding as it gulped in the tree’s life blood.

Looking around at the shriveled and fallen leaves of the big trees around my office, it was hard to believe that such a small creature could cause so much damage! The sucking insect I had found was so tiny that you could line up four of them nose to tail across the tip of a seven millimeter pencil lead.

After much research, I discovered that what I had found is called a Lerp Psyllid (*Glycaspis brimblecombi*). It is a new pest from Australia and New Zealand.

The Red Gum Lerp Psyllid prefers to feed on red gums *Eucalyptus camaldulensis*, but has been known to feed on other eucalyptus species when necessary. Field observation confirms that they usually do not survive to adulthood when this happens.

The so-called “Lerp” is a domed-shaped home made by the nymph from eucalyptus gums and resins.

Lerp Psyllids excrete honeydew, which drops onto cars and sidewalks. Sooty mold forms on excess honeydew, and imparts an unsightly appearance to the leaves. Adult Lerps are about 3 millimeters long, light green or yellow in color, and move by flying or hopping about.

Pesticides should be used sparingly, so as not to kill predators, and to allow time for biological controls of this pest to take place.

The foliage of affected trees has a shriveled look. At a distance, the tree may look as if it is suffering from drought stress. Severely infested trees can lose their leaves, and weakened trees without vegetation may fall prey to the eucalyptus longhorn borer (*Phoracantha semipunctata*).

Several species of indigenous predators, including the Coccinellid beetles, *Harmonia axyridis*, *Chilocorus bipunctatus* and *Hippodama convergens*, as well as an anthocorid species, are feeding on the Lerp Psyllid without much effect.

Some of you may recall the severe damage caused by the Eugenia Psyllid, which went unchecked throughout California until the introduction of a tiny parasitic wasp from Australia.

It is believed that the current Lerp Psyllid outbreak in northern California will be controlled by winter weather. Southern California, however, will not be so fortunate.

Researchers from the University of California are currently in Australia and New Zealand, where they are searching for another *Encarsia* type predatory wasp. The goal is to release the wasp in California to control the Lerp Psyllid infestation.

Severely affected trees, or trees of high economic value, may be sprayed with insecticide or insecticidal soap. You should consult with your local Agricultural Commissioner or Pest Control Advisor for approved chemical controls. Irrigating affected trees may help them recover, and will help reduce their attractiveness to the eucalyptus longhorn borer.

Red gum eucalyptus are widely planted throughout California as a durable and drought-resistant tree. They often thrive in harsh areas, which would kill a less resilient species. If the red Gum Lerp Psyllid infestation is not brought under control, California stands to lose a valuable landscape tree.

John A. Stepp is an arborist and licensed Pest Control Advisor for the State of California Department of Transportation.

Pesticides should be used sparingly, so as not to kill predators, and to allow time for biological controls of this pest to take place.

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Is Your Business Behind the Curve?

Is your business typical?

A recent survey of 300 small business owners commissioned by NEBS, a leading manufacturer and supplier of business forms, checks, labels and other printed products, generated some interesting results. The survey focused on owners of businesses with 20 or fewer employees.

How does your tree care business compare to small businesses across the country? Are you keeping up with your fellow small business owners?

The survey found that only 35 percent of respondents use financial or accounting software to pay bills. Despite the fact that 79 percent of respondents say they use computers in the workplace, 73 percent still write out checks manually.

Thirty-eight percent pay their bills monthly, 25 percent pay weekly, 22 percent pay as invoices come in, and six percent pay daily.

Technology has not moved quickly into the debt collection process for many owners either. Forty percent monitor their receivables manually, 24 percent are either not tracking at all or are unfamiliar with the tracking systems they have in place. Only 33 percent rely on computer programs.

No matter which method owner use to track receivables, most are in charge of collections. The largest number, 40 percent, use the phone to collect, 28 percent send a second bill in the mail and 14 percent send past-due notices.

How do you compare technologically?

- Almost 80 percent use computers.
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- More than half are on the Internet.
- Three-quarters have a CD-ROM drive.
- More than half do not have a specific advertising budget.
- Almost 40 percent rely on word of mouth to advertise.
- Twenty-one percent report buying Yellow Pages ads.

How do you spend your day?

Like many tree care company owners, small business people in other industries spend a lot of time on office tasks. Twenty-one percent report spending most of their time on accounting and bookkeeping, while slightly more, 22 percent, spend the majority of their time on sales and customer contact.

The survey also found that 49 percent of businesses are profitable within the first year, 12 percent within two years, eight percent within three years and ten percent after three or more years. Though they are earning profits, they are still struggling to collect bills. While 35 percent report no uncollected accounts, 16 percent either do not know their receivables status or have yet to collect on 10 percent or more of their outstanding invoices.

And what do small business owners feel are their biggest weaknesses? Accounting and bookkeeping, according to 19 percent, while nine percent answered marketing.
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A Veteran Urban Forestry Consultant Looks At the Future

By Richard E. Abbott

The Evolution of Urban Forestry

A look to the future must begin with an examination of the past. We learn from history in every field. Urban forestry is no exception.

The Commonwealth of Massachusetts enacted public tree legislation as early as 1786. In 1899, each town was required to elect or appoint a tree warden to oversee the planting and removal of public trees. Training was strictly on-the-job, and their tools consisted of hand saws for pruning, manual cross cut saws and axes for tree removal, and picks and shovels for planting.

In the early 20th century the tree surgeon began to appear. These workers, who were vocationally-trained in the art and science of repairing individuals trees, became a fad at the turn of the century in response to books on “Tree Doctoring.” Tree surgeons went from estate to estate plying their trade. Tree cavities were the rage. Many were employed by emerging tree expert companies. Some colleges offered courses in arboriculture and the first professional and trade associations were started during this period.

The term “arborist” emerged in the 1950s. An arborist could be college or vocationally trained in the practice of tree care maintenance, planting and line clearance tree trimming, and could work for a municipality, commercial tree care company or an electric utility. With the introduction, after WWII, of new mechanically powered equipment, such as chain saws, bucket trucks, chippers and stump grinders, and agricultural chemicals like insecticides, fungicides and miticides, the work force had to have more technical training. Alex L. Shigo, Ph.D., researched and found inaccurate many of the early “tree surgery” practices, like tree wound dressing. Dr. Shigo also described compartmentalization of decay in trees (CODIT). The introduction of Dutch Elm Disease in 1929, its subsequent spread and the resulting urban tree losses, caused most municipal tree budgets, and many private tree owners, to focus on tree removals.

The urban forester of the 1980s was a more comprehensive professional, college trained in the sciences of managing trees in, or next to, urban areas. Urban forestry was also a new science responding to the municipal tree losses caused by Dutch
Elm disease. The need was based on the recognition that any biological natural resource, like trees, could only be environmentally and cost effectively managed if the numbers, species, location, condition and size were known. Species diversity was necessary to protect against any possible catastrophic loss from new diseases or insect pests. Early street tree inventories were on 3 x 5 index cards, until personal computers began providing the versatile electronic management information tool to provide the database and information to manage the urban forests.

The Present

Just managing the trees in the urban forest will not produce the optimum ecological effect. Governmental research and policy setting organizations, leading urban forestry scientists, environmental technology groups and conservationists recognize this. As a result, a new group of college trained, multi-disciplinary professionals, called urban ecologists, are emerging. The urban ecologist’s responsibilities are to evaluate, recommend and manipulate all the trees, native vegetation and natural resources on public and private, developed and undeveloped property. All biological natural resources in an urban area need to be managed as one ecosystem. We need to recognize that a response in one ecological area could have an off-setting positive or negative environmental reaction some place else in the ecosystem. The street tree inventory was the tool of the urban forester and Global Information Systems (GIS), Global Positioning Systems (GPS), aerial photographs, infrared photos, satellite imagery, land use planning and natural resource maps will be the tools of the urban ecologist.

The Future

The science and profession of biological-ecosystem, natural-resource, urban forest management and manipulation in the developed and undeveloped urban area can be expected to incorporate yet undiscovered sciences. Knowledge today doubles in less than five years. The professionals of the future must have more advanced technical, environmental, scientific and communications training. They will have more authority and greater responsibility over the ecosystem. Routine considerations will include how a local environment can be manipulated to affect “Global Warming,” air pollution mitigation, carbon sequestering and storm water...
runoff. They will consider the impact of green vegetation on the quality of life issues. Employers will better train the urban ecosystem workforce in the use of new labor saving devices. These could include laser pruners, personal aerial platforms and computer chips imbedded in trees to continuously provide information on physiological processes, as predicted by Dr. Shigo and others.

Evolving Technologies

Tree management information software programs today can provide continuous work histories, as well as the traditional data on species, size, condition and location. Programs can also keep and track records on property owner contacts and inspections by city employees. We can very accurately plot actual physical tree locations on maps or computers using either GPS, laser range finders or aerial photogrametry. Clicking on that tree’s symbol can show digital visual images of each tree or video tape clips. We can download tree management information, maps and images directly from computer databases, take it to the field for visual inspection and correct it, if necessary. We can then upload it directly into the computer data bank and update the record. All of this can be done without anyone in the office having to keypunch the data, and no interface software is required to transfer data from the handheld to the PC or vice versa.

Pruning results will be predictable by scanning a picture of a tree into a computer. Certain branches will be removed, so you can see how the tree will look after simulated trimming, but before any branches are actually removed. Having students select branches to remove on a computer screen can teach proper pruning practices. When the computer removes the branch, the student can see what the tree will look like. If the wrong branch is removed, the computer can show where the proper cut should have been made.

New electronic instruments for monitoring diseases and insects will permit more site and pest specific corrective and remedial treatments for any particular tree health problem. This will be less of a shotgun approach to insect, disease and physiological maladies. No more blanket sprays. We will use Integrated Pest Management (IPM) to monitor and determine when remedial or corrective actions are warranted. We will use biological, chemical and other ‘controls’ only when tree health is threatened.

X-ray, ultrasound, sonic or instruments not yet invented will reduce the uncertainties about detecting decay, its extent and how decay affects the tree’s structural integrity. The instruments available today focus on a limited area. Future instruments will readily identify the entire decay pattern within the tree. This will help detect hazard trees so they can be removed. Certain types or patterns of decay are difficult to detect with today’s instruments.

Vocational testing and certification, technical registration and regulation by professional and trade associations will extend to all aspects of diagnosis, insect and disease control, care and maintenance, planning and consulting for urban ecology management. However, pesticide registration and use will continue to be a governmental responsibility.

Education in the sciences to manage the urban ecosystem will be available at more colleges and universities. The number of advanced urban ecosystems degrees awarded will double in the next 10 years in response to increasing job opportunities. A graduate must be familiar with land use planning policies and procedures, as well as knowledgeable in the plant sciences, soils and environmental sciences.

By the year 2025, there will be no overhead electric distribution wires and planting tall-growing trees along the streets will be common practice. That will revolutionize urban forestry management as we know them today.
While the competition has been developing complicated excuses and even more complicated inefficient drive systems Carlton has developed the most powerful cutting portable available. Carlton's exclusive turn table design provides huge cutting dimensions while allowing the use of highly efficient two stage cutterwheel drive system. This patented arrangement gives the Carlton 4400-4 the ability to out cut all other portable machines.

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Global warming, urban heat islands, energy conservation, storm water runoff reduction, air pollution mitigation and many other factors are going to require the planting of trees in inner-city locations. Putting them along large, blacktop parking lots and in vacant areas helps to slow and absorb storm water. Trees planted near air pollution emission sources are five times more effective at mitigation than an identical tree in the woods. Infrared satellite photography will identify the locations where vegetation management can affect energy conservation and urban heat islands. Sacramento, California has an extensive urban tree planting project to eliminate the need to build another power plant.

At another California location, storm water retention and runoff reduction by trees were the determining factors in how much native tree cover removal could occur to fit residential housing construction. Tree canopies intercept 70% of all the rainfall. If extensive tree cover is removed, storm water runoff will increase. The developer must pay the municipality for the new storm water system capacity to handle the increased runoff expected.

Local and regional government authorities are conducting research on air pollution mitigation and annual increments of carbon sequestering. Speculation is that responsible governmental agencies can sell those air pollution credits to an industry needing to clean up their pollution. Currently, air pollution credits are sold on the Chicago Mercantile Exchange.

The pruners of the future may be lasers, high pressure water jets or other emerging technologies. Laser will work, but it is expensive, requires a lot of equipment and there are dangers to airplane pilots from shooting lasers into the sky. It’s just a matter of time, though, before they replace the gasoline-powered chain saw.

Personal aerial platforms may sound like Buck Rogers at his finest, but experimental, individual power packs that lift a person into the air for a short time exist. An economical and practical need exists, so some entrepreneur will make it happen.

I have tried to be very conservative, yet optimistic. I see a great future and an increased public appreciation and recognition of the benefits and values of urban forests/urban ecosystems.

Richard E. Abbott has been involved in urban forestry for more than 40 years. This article is excerpted from his keynote address to the Irish National Urban Forestry Conference, held in the spring of 1998. Abbott is founder and CEO of ACRT, Inc., an international urban and utility forestry consulting firm, headquartered in Cuyahoga Falls, Ohio.
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If You Can’t Attend TCI EXPO ’98
By Richard Ensman

You know the benefits of attending TCI EXPO, your arborist trade convention: demonstrations of valuable new products, the opportunity to learn about advances in your field, new contacts, and much, much more. TCI EXPO is the largest arborist trade show under one roof, featuring more than 160 exhibitors, talks by experts on tree care and small business, climbing and rigging demonstrations and unparalleled networking opportunities.

Unfortunately, you can’t attend every green industry trade show. Perhaps you can’t attend this year’s TCI EXPO in Baltimore. If you must miss this year’s event, resolve to make the most of the professional advancement opportunities available to you while TCI EXPO is running. Here’s how:

• **Inventory convention priorities.** Suppose you were going to TCI EXPO. What would you most like to learn? New product information? Training techniques? New customer motivation tools? While the convention is going on,
make it a point to do some serious research and reading on these issues back home.

♦ **Find a liaison.** Ask an EXPO-attending colleague to serve as a convention “reporter” for you. This individual can share notes from the convention, pick up show materials for you, and give you a firsthand account of important TCI EXPO activities.

♦ **Contact area colleagues.** If you can’t attend TCI EXPO, you can’t network with participants there. But make a few telephone calls and find out which of your colleagues are also staying home. Set up a local lunch for the first week of November, or get together for an informal professional discussion. If networking is important to those attending TCI EXPO in Baltimore, it should be just as important for you at other times.

♦ **Use the vendor list.** Explore the list of vendors exhibiting at TCI EXPO. As you identify products or services that interest you, call or write the appropriate vendors. Mention that you’re going to miss their exhibits, but you’d still like information or samples.

♦ **Begin an idea file.** Just as you might start a personal idea file while in Baltimore, begin one at home. Resolve to fill it with at least 100 bright ideas during the convention period.

♦ **Request materials.** You can purchase tapes of some of the lectures presented. You can select items on subjects of particular interest, usually at nominal cost.

♦ **Explore the thoughts of convention speakers.** Make a list of TCI EXPO’s major speakers, such as Don Blair, Phil Wargo or Phil Nilsson, as well as other individuals who are presenting workshops of interest to you. While you can’t attend these, you can still call your public library or conduct an Internet literature search to obtain copies of articles they’ve written.

♦ **Participate in a local seminar.** Around the time of TCI EXPO, pick a professional subject of interest to you and enroll in a local seminar on the issue. Where? Try a college in your area, Chamber of Commerce, extension ser-

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See us at TCI EXPO ’98!
The International Society of Arboriculture is the largest and most influential arboricultural organization in the world. Today's ISA is...
New to the Third Annual NAA Student Career Days at TCI EXPO '98, is the Arboricultural Skills competition. This exciting event gives students a chance to demonstrate their climbing, throw bag and cabling skills, as well as test their knowledge about general tree biology and safety during tree care operations.

Generous support from commercial tree care companies makes this event possible. The Arboricultural Skills competition is lead-sponsored by Arbor Care and co-sponsored by Davey Tree Experts, Bartlett Tree Experts, SavATree, Treemasters, and ArborMaster Training. The companies not only pledge financial support but help organize, provide supplies and judge all of the competition events.

The work climb, throw bag and cabling events will be held at the Baltimore Zoo. The work climb will be organized somewhat like an ISA Jamboree, only geared at the student level. Safety always comes first in these events, so students will not be encouraged to exceed their abilities.

For students new to climbing or those wishing to increase their general climbing knowledge, Ken Palmer and Rip Tompkins of ArborMaster Training will offer a climbing workshop right at the event site.

The judges will base their scoring on a number of qualities. For safety's sake, a pre-set rope will be used and the competitors will start from a work station in the tree. The pre-set rope ensures that a good crotch both for safety and positioning has
been chosen. By starting from a pre-determined work station, the competitors will not waste valuable energy taking unnecessary chances or moving too fast as they ascend the tree.

Scoring for the work climb will be based on each competitor’s time. However, more important than time is the competitor’s overall safety awareness while climbing, an ability to visualize, plan, and execute a climbing route, and poise and style. In order to minimize the importance of the time clock, judges will penalize climbers for climbing errors, such as unsafe or hasty movements, failure to lanyard-in where necessary, allowing too much slack in the climbing line, etc. Throughout the event, students will be offered advice and coaching when required to ensure that all participants have a positive learning experience.

The cabling event gives the students a chance to demonstrate basic technical skills. The event will take place on the ground with a set choice of cabling hardware and similar-sized logs to ensure that all competitors are tested equally. This is a team event, reflecting the teamwork needed by professional tree workers when installing cables. The judges will score according to the team’s ability to recognize and choose the appropriate cabling hardware; properly align and drill holes for hardware installation; accurately cut cable at the proper length; correctly install preformed cable grips with thimbles; as well as set the proper cable tension.

Other competitions, such as the throw bag event, written exam and safety equipment inspection test the student’s skills and knowledge even further. At all events, judges from commercial tree care companies will not only score events, but instruct students in proper techniques and be available to answer student questions. Students will have a unique opportunity to ask the highly skilled judges for critiques and helpful suggestions to improve upon their skills.

Other green industry associations have long sponsored these types of student competitions. The Associated Landscape Contractors of America (ALCA) has a well-established Student Career Days and Competition. The ALCA event even has a small arboricultural competition. Active events are a great way to show students that commercial tree care is a dynamic business with many exciting careers. More important, it gives tree care professionals a chance to meet and mentor young people who will one day be the “movers and shakers” of commercial tree care. If you are not directly involved in the Student Career Days Job and Internship Fair or Arboricultural Skills competition, look for young people wearing brown badges on the trade show floor and in seminars. Take a moment to welcome them and share your passion for the great field of arboriculture.

Robert Rouse is staff arborist for the National Arborist Association.
NAA Associate Members & 1999 Winter Management Conference

Recognition - n. acknowledgment. the process of causing attention

It’s time again to acknowledge and those NAA Associate Members who have made a difference in NAA’s ability to deliver a topnotch 1999 Winter Management Conference, including a great educational program, while providing social events that make the conference a uniquely memorable event. Twenty companies are providing financial support for some of the major programs during this annual meeting. The following Associate Members have graciously given their resources to cover, in part, the costs of the following activities:

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Ogilvy Gilbert Norris & Hill Insurance Agency
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Southco Industries Inc.
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Two new features for the 1999 program include the All Delegate Luncheon, Jan. 27, hosted by:
Bandit Industries Inc., Cummins Engines, The Hartford, the J.J. Mauget Company, Ogilvy, Gilbert, Norris & Hill Insurance, Power Great Lakes, Inc., TECO, Inc., Vermeer Manufacturing Company and Wood/Chuck Chipper Corporation. This luncheon promises to be interesting and your participation is welcome. As a promotional incentive, Cummins Engines is offering a discount voucher worth $1,000 off the purchase of your next Cummins-powered chipper.

Another new feature for this upcoming year is the continuously-looped video presentation, which will be shown in the registration area during the conference. Those companies contributing their video footage are Aerial Lift of CT., Bandit Industries Inc., Husqvarna Forest & Garden Company, Morbark E-Z Beever Company, SawJammer Company, Southco Industries Inc., Vermeer Manufacturing Company, Wood/Chuck Chipper Corporation and Woodsman.

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(3) Morbark Model 16: 16-inch capacity 250-hp Cat
(1) Model 1900 Tree Bandit w/loader 475-hp Cummins

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TCI CARE INDUSTRY - NOVEMBER 1998
The ancient elm perched, like a weary sentinel, at the edge of the Widow Carter’s driveway. It had seen better days. With bitter weather on the horizon, the Widow phoned her favorite ISA certified arborist, Big Al Fontaine, to remove the dying relic.

On arrival, Al found no access for an aerial lift. “No problem,” Max Bunyan bellowed as he confidently footlocked to the top of the elm. Tying in and securing a block with a sling to the top of the tree, Max intended to take the old, dead top from the tree and lower it to the driveway with Al acting as ground man, by means of a Bollard device, fastened to the trunk. Max completed a back out and, just as expected, the top of the tree swung away from him like a wrecking ball. All seemed secure.

Then, suddenly, the tree snapped like a bull whip, taking the block with it. Max’s anatomy constricted as he heard the Widow shrieking below him. But, as the top of the tree sliced the Widow’s driveway, Max heaved a sigh of relief—his climbing line was still secure!

Suspended above the ground, grinning broadly, Max noticed a faint buzzing sound. In just seconds, the buzz became a roar as a swarm of angry bees billowed from the hollow maw of the tree and swallowed poor Max. As bees pelted him like Japanese zeros at Pearl Harbor, Max pondered a few crucial points that he had overlooked that morning.

1. **Observe the Tree Environment**

   Look for electrical lines, utility lines, potential targets, etc. Make sure that none of these hazards are present in the tree environment, or if they are, follow the proper safety procedures associated with their presence.

2. **Look for Evidence of Decay**

   Look for conks and mushrooms growing at the base of the tree. Check for exposed roots and recent heaving or cracking of the ground. Inspect for bees and other critters that might be occupying an otherwise harmless-looking tree.

3. **Inspect Your Equipment**

   Even if the tree and the environment seem okay, ANSI standards mandate that all climbing equipment **SHALL** be inspected before each use. That includes rope, climbing saddles, lanyards, etc. Anytime you get involved with rigging or climbing, or even when working with rigging from a bucket truck, you must thoroughly inspect your equipment and ropes BEFORE you leave the ground. Consider the tree to be part of your equipment.

   Despite its lofty character, climbing and rigging is a highly-developed skill, nonetheless anchored in a foundation of fundamental safety practice, training and experience. The fundamentals should never be overlooked.
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Every now and then a removal comes along when upon first inspection, one thinks, "Oh-great! What have I gotten myself into this time?" Actually, sometimes these turn out to be the most challenging and satisfying jobs of all.

This particular removal involved a 26 inch DBH hard maple that had declined for several years, before armillaria root rot finished it off. Having existed in this condition for some time before we were able to schedule its removal made climbing now a questionable option. The trees location only complicated matters. The tree in question was tightly nestled in and among several delicate white pine, paper birch and red bud trees on a hillsid, in an exquisitely developed fish pond area of our Eagle Point Park, which overlooked the mighty Mississippi River. One of the interesting features of this area is how the abrupt elevation changes are handled through the use of native limestone walls.

Here is the dilemma I faced. The tree was located 70 feet from the edge of the parking lot and over an embankment with a 10- 12 foot elevation change. Trees, rock walls, raised limestone picnic areas and fire pots prevented us from accessing the area with our equipment. Felling was not an option. Cutting away larger sections of the tree at one time would only damage other valuable trees, not to mention creating an awful lot of work moving the wood and brush to where it could be worked up.

After standing back for a broader view and contemplating my options, it occurred to me that we just might be able to pluck the tree from its location and set it down in the parking lot, where it could be worked up almost effortlessly. Cranes are awesome pieces of equipment. I have used them in a number of different applications, so I decided to try one more. Having done the math in calculating the approximate weight of the tree and determining the work radius (from the cranes turret to the center of the tree), I was able to determine that we could get the job done with a 65-ton crane.

On the day of the scheduled removal, we were in and out inside of two hours. Preplanning really pays off! When the crane arrived, I discussed my plan with the crane operator and my crew. We all agreed with the best set up, and proceeded as though the plan had been rehearsed a dozen times. Once in position, the crane lowered its load line down through the center of the tree. I attached my climbing line to the hook on the cranes big block and rode it into the tree's crown where I strategically placed the chain sling. Once in place, I rappelled to the ground, removed my climbing line and proceeded to cut through the tree at its base.

Just as planned, the crane hoisted the tree up and out into the wide open parking lot where it was laid down to be worked up by a thankful crew. It doesn't get much easier than that!

Steven F. Pregler is city forester for the City of Dubuque Parks Division in Dubuque, Iowa.
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Visit our “Online Showroom!”
www.aeriallift.com

Aerial Lift Inc. is an authorized dealer and distributor of Greenlee Fairmont and Textron Fairmont "Limb Lopper" tools.

For tools, parts or service call us on our 800 numbers.

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Please circle 2 on Reader Service Card

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