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COVER PHOTO:
Tree fertilization with the liquid soil injection method. Photo courtesy of the Davey Tree Expert Company, Kent, Ohio.
In recent years, there has been an increasing number of injuries resulting from the improper use of disc-knife chippers. We have seen everything from the loss of fingers to the loss of an arm. In every instance that I am aware of, these incidents have occurred because the operator didn’t follow manufacturer’s directions or adhere to proper procedure.

Manufacturers place warning and instructional decals on their chippers to alert operators not to get too close to the feed system. They also provide instructional tapes and other materials with the purchase of a new chipper. In addition, a Chipper Safety Video Tape is available from NAA and all operators would benefit from viewing it.

When these instructional materials are not used, injuries increase. Often, these injuries lead to suits against chipper manufacturers, with the plaintiff claiming that the accident was the result of the faulty engineering design of the chipper. It requires a tremendous legal effort to convince a jury that improper use—not improper engineering—caused the accident.

To blame an accident on the design of the chipper is like saying that every automobile accident is the result of the design of the vehicle rather than the bad driving habits of the operator behind the wheel.

Recognizing their vulnerability in legal cases involving injuries and in the interest of operator protection, some disc-knife chipper manufacturers have produced units with lengthy feed tables. Others have altered their original feed table design and are now producing chippers with substantially longer feed tables.

They also have sent notices to owners of disc-knife chippers and advised them of the availability of kits to modify their equipment. Only about 60% of the chipper owners have responded to these notices.

That response rate must be increased. Disc-knife chipper owners must be convinced to follow the manufacturer’s recommendation and install the modification. Sure, it costs some money. An accident costs considerably more. Pain, permanent disability and disfigurement aren’t reasonable risks to impose on a chipper operator. If you have a “short infeed table” disc-knife chipper, modify it now.

Robert Felix, Publisher
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Tree Fertilization
Why And When It Is Appropriate

By Elton M. Smith

As professional arborists, how do we determine if a tree should be fertilized? Should we just assume that all trees should be fertilized on a regular basis and suggest fertilization accordingly to the customer? Since many trees do not have to be fertilized annually, we need to use the various tools available to us to show the customer why fertilization is appropriate or needed.

Evaluating needs
Arborists should be able to point out to property owners the annual growth of their trees. Annual twig growth should be normal for the species and tempered by recent climatic conditions such as drought, insect infestations, etc. Color of foliage is a good indication of current growth and is the criterion most property owners will use to request fertilizer treatments.

Although toxicities can and do occur on occasion, most leaf color changes caused by nutritional factors are deficiencies of one or more mineral elements. It is important to recognize that deficiencies can occur due to changes in soil pH. If the soil pH becomes too acidic, the availability of elements such as magnesium becomes limited while alkaline soil leads to iron or manganese deficiencies. Correcting the pH without mineral element additions will often correct the problem of mineral element availability in the soil.

The elements most often limiting to woody plants include nitrogen, potassium, magnesium, iron and manganese. To aid in diagnosis, the foliar symptoms to look for are as follows for each element:

Nitrogen—Smaller than normal leaf size and a general uniform lighter green to yellow-green color. Older leaves are usually affected first and often the reason that inner leaves turn yellow and fall from the tree.

Potassium—The symptom to look for first is yellow or brown leaf margins. Some downward curling may occur and like nitrogen, usually first observed on older foliage.

Magnesium—Marginal chlorosis can be severe in soils at pH of 4.5 or below. This condition is often observed in sandy soils, which tend to be acidic.

Iron—Distinct yellow or white areas between veins are the classic iron deficiency symptoms. Leaves will often abscise in severe cases, with twig dieback often seen with oak species.

Manganese—Initial symptoms are similar to iron deficiency followed by the development of necrotic spots on young chlorotic leaves. Maples are most often susceptible to this deficiency.

On occasion, other mineral elements can be deficient and foliar symptoms occur, as is the case with zinc deficiency of nut trees such as pecan.

Two common laboratory tests are available for all arborists to use to monitor their fertilizer program or to diagnose suspected deficiencies. Soil and foliar or tissue testing have been available for years by private or public labs in nearly every state.

If for no other reason a soil test is valuable to determine soil pH. The importance of knowing soil pH is to help determine the degree of acidity and/or alkalinity which directly affects the availability of mineral elements. A soil test will also reveal the levels of phosphorus, potassium, calcium magnesium and cation exchange capacity. Arborists request various minor elements, organic matter and soluble salts. These additional tests are particularly valuable for properties containing a wide assortment of landscape plants.

A foliar analysis is usually more accurate because it indicates what mineral elements are in the plant, not which are available in the soil. Most labs test for 12 to 15 mineral elements. Foliar analysis is the best available method to determine deficiencies of iron, manganese and magnesium, which all look relatively similar in symptom expression. Although most nurserymen use this procedure to monitor their fertilizer program, it is usually utilized by arborists to diagnose mineral element disorders.

When to fertilize
Increasingly more arborists are fertilizing trees in autumn and winter, although historically trees have often been fertilized only in the spring. Even though leaves may have fallen, tree roots remain active in fertilizer uptake in autumn until the soil moisture freezes. This suggests that fertilizer will be taken up by the roots in
Typical nutrient deficiency symptoms on pin oak (left) and pine species.

November or December or throughout the winter if the ground is not frozen and soil temperatures remain at approximately 40 degrees F. or above in the root zone area. If only one treatment of fertilizer can be applied each year, autumn would be an excellent time for application in most soils. If the customer is willing to pay for multiple applications, split the treatment between autumn and early spring before new vegetative growth begins. Fertilizer can be applied throughout the spring and into July. However, except for correction of minor element deficiencies, fertilizer should not be applied beyond midsummer.

Some firms are using slow release fertilizer in their operations and obtain satisfactory tree growth for two or more years with a single application. The time of application is less critical with two-year treatments, however, a similar time schedule as outlined above can be followed.

Method of application

Several methods are available for fertilizing trees and shrubs, including lance injection, drill hole, surface, foliar spraying, trunk injection and implants.

Lance injection, a technique that uses water soluble fertilizers under pressure, has become very popular due to its ease of application and reduced application time. In addition, water is added to the soil. The soil should be moist whenever fertilizer is applied to avoid soluble salts injury.

The lance method provides some moisture but not necessarily all that is needed if soils are dry.

Drilling holes 1 1/2 to 2 feet into the soil is useful in those soils where air is desirable, such as compacted sites or clay loam soils. The fertilizer is applied in the holes and the holes may be left open or filled with organic product such as compost, or an inorganic product such as calcined clay or pea gravel.

Surface fertilization is adequate in beds or areas where there is no soil cover. Applying fertilizer broadcast over turf may result in fertilizing the turf only, causing the turf to become greener than surrounding turf or burning the turf, which is easy to do at rates recommended for trees.

Foliar spraying is used principally to correct minor element deficiencies such as iron in oak, manganese in maple, etc. Many arborists supplement tree fertilization with foliar fertilizing when spraying for pests, but do not rely on this method to provide all the necessary nitrogen, phosphorus or potassium.

Injection into the trunk or root flare area of the trunk has been useful in correcting certain minor element deficiencies. This works best when the soil is moist and trees are not under stress.

Implants containing dry salts inserted into the flare of tree trunks have been very successful in correcting iron deficiency of oak and other species. This method requires drilling a hole and inserting a capsule containing concentrated fertilizer into the wood and under the bark tissue.

Additional information on fertilizing trees and shrubs is available in the National Arborist Association Fertilizing Standard and from Cooperative Extension Service publications at county offices.

Elton Smith is an Extension Service Specialist, Landscape Horticulture, at Ohio State University.

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Thanks
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Methods & Materials

What Types Of Fertilizer To Use And How To Use Them

By Brian Barnard
TCI Staff

A fertilizer is any material that supplies nutrients (chemical elements) required for plant growth and development. Fertilizers are not to be confused with soil amendments, such as vermiculite, sand or ground pine bark, which are used to alter the natural physical properties of the soil. Amendments may be used to alleviate the effects of soil compaction, and fertilizers and amendments may be used together to improve tree vigor.

Three primary nutrients—nitrogen, phosphorus and potassium—make up a complete fertilizer. The fertilizer’s guaranteed analysis shows the minimum guaranteed percentage by weight of nitrogen, phosphorus and potassium, in that order. For example, 20-10-10 fertilizer contains 20% nitrogen, 0% phosphorus and 10% potassium.

Nitrogen, the element involved in the production and maintenance of green foliage, is the nutrient that is most often deficient in the soil. Fertilizers developed for tree care companies are generally high in nitrogen. Analyses of 30-10-7, 28-9-9, and 32-7-7 are commonly used.

Experts agree that phosphorus and potassium should also be added. “The most important formulation to apply is one which contains those nutrients that the tree is most in need of,” says Roger Mellick, vice president of Doggett Corporation, in Lebanon, New Jersey, a major supplier of fertilizer to the tree care industry.

Know the soil condition

Tom Smiley, of the Bartlett Tree Research Laboratories in South Carolina, the research arm of the F.A. Bartlett Tree Experts, of Connecticut, advises arborists planning to establish a tree fertilization program to know the soil condition. “We usually recommend a soil sample be sent to the lab for analysis. From this information, we can decide what is necessary,” he says.

Roger Funk, vice president of technical and human resources for the Davey Tree Expert Company, in Kent, Ohio, feels that beginning arborists tend not to apply enough fertilizer. For optimum tree growth, he generally recommends 3 pounds of actual nitrogen per 1,000 square feet of area under the branch spread of the tree per year, or 6 pounds every two years. If foliage color, annual growth or general vigor is not normal, he suggests increasing the annual application rate to 5 to 6 pounds.

Soil pH and deficiencies

Micronutrient or trace elements are usually available in adequate amounts, unless unusual soil conditions exist. Deficiencies can occur when the soil pH is outside the normal range. “Our big push now is with micronutrient analysis and pH alteration. It goes further than N-P-K,” says Smiley.

Calculating Fertilizer Amounts for Established Trees

Square Foot Method—The surface area under the circular branch spread of a tree can be calculated as follows: surface area = radius² x 3.14. The radius is the distance from the trunk to the tree’s dripline, assuming it has a symmetrical crown. For example, a tree with a total branch spread of 36 feet would have a radius of 18 feet. The area, according to the formula, would be 18 x 18 x 3.14, or 1,017 square feet.

To fertilize the above tree with a 20-6-12 fertilizer:

3 lb. N per 1000 sq. ft./.2 = 15 lb. of fertilizer

Use Caution! If the area under the branch spread contains impervious surfaces such as walks, driveways, or building foundations, the square foot calculation method may be unsuitable. Reduced soil area does not diminish the tree’s need for fertilizer; however, over-application to the remaining area can cause sod and tree root damage.

The DBH Method—Measure the DBH, the tree trunk diameter at 4-1/2 feet above grade. Generally for optimum growth, apply 1/4 lb. actual nitrogen per inch DBH to trees under 6 inches DBH. The rate can be increased to 1/2 lb. nitrogen for trees over 6 inches DBH.

For the same tree, which has a 6 inch DBH:

6 (DBH) x .5 lb./inch = 3 lb. N
3 lb. N/.2 = 15 lb. of fertilizer

Again, use caution to avoid over-application. The square foot method is preferable to the DBH method for trees growing in areas with restricted root space.
Fertilizer delivery systems—clockwise from upper left: Surface applications can be used in mulched areas or around shrubs; the punch bar method for dry fertilizers; power auger used to drill fertilizer holes; a fertilizing lance used for liquid soil injection; trunk injection is valuable for correcting micronutrient deficiencies; the Grow Gun pneumatic soil aerator; the Terralift soil aerator.
Funk says that trees are usually deficient in only one micronutrient. If several are used, not enough of the necessary element is applied and results are not always satisfactory. This is due in part to the severity of the deficiency, insufficient applications of the required micronutrient and soil problems such as excess alkalinity or poor drainage.

**Method of choice**

Various fertilization methods are available, but the method of choice involves injecting the fertilizer solution into the soil with high pressure. Mellick points out that soil injection helps aerate the soil while simultaneously providing water and nutrients. Dilute fertilizer solutions should be applied at the rate recommended by the manufacturer, according to operating pressure and flow rate of the equipment used. Apply sufficient liquid mixture to supply the required rate of fertilizer. The National Arborist Association Fertilization Standard recommends using 150 gallons of solution per 200 square feet, or approximately one-half gallon of solution per injection on a 2 1/2-foot injection spacing.

New types of equipment designed primarily for soil aeration can also be used to inject fertilizer. The Grow Gun and the Terralift are pneumatic soil aeration machines that are capable of producing saucer-shaped fractures in the soil and delivering solid materials. Researchers are currently looking at these machines’ effectiveness.

Dry fertilizers can be delivered to the tree root area by filling holes made with a punch bar or power auger. These methods have been around a long time and have been rendered virtually obsolete by the relative speed and ease of other methods.

Surface applications are quick and easy and can be used on mulched areas or around shrubs. Neither Doggett nor Davey recommends surface fertilization for shade trees because high concentrations of a surface fertilizer can burn grass. Also, phosphorus and potassium do not move readily through the soil. Surface fertilization limits the amount of these essential nutrients that reaches tree roots.

Foliar application and trunk injection are sometimes viable alternatives to more conventional methods of fertilization, particularly for correction of micronutrient deficiencies. In situations where soil fertilization is not possible, these methods may be the only means of providing adequate nutrition.

Arborists must have an understanding of the factors involved with a successful tree fertilization program. These include the needs of the tree, pre-existing soil conditions, water availability, the analysis of the fertilizer product, the proper rate of application, and the appropriate method of application. With this information, the arborist can provide a fertilizer prescription with optimal results.

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Marketing
How To Persuade People To Become Your Customers

By Kay Johnson
NAA Director of Management Services

Dick Proudfoot of Pruett Tree Service in Oregon defines marketing as "everything I do at work and away from work that causes more people to buy from me rather than anyone else." Proudfoot adds that customers buy anticipated good feelings that result from the purchase, not the actual services that tree care firms provide; customers assume that proper arboriculture care will be provided. He also says that marketing is not magic and applies to every business, regardless of its size. He finds bookstore marketing books too technical to be of use to the small business owner who wears many hats, however.

One easy way to discover what customers are anticipating is to ASK THEM DIRECTLY, Proudfoot says. For example, a customer may call and ask you to top a couple of his trees. From your knowledge of proper tree care techniques, topping the tree is not appropriate in this situation. By asking questions and listening carefully, try to understand what the customer wants as an end result. Then explain, "Topping the tree would not enhance the appearance or health of that lovely tree. I recommend standard pruning, which would remove the dead, diseased and weak branches while maintaining the tree's strength and aesthetic appeal." If the customer can not be persuaded to allow proper tree care procedures, adhere to professional and ethical standards and refuse to top the trees.

Proudfoot also emphasizes the importance of the following:
- a company name and logo;
- good quality printed material such as business cards, stationery, invoices;
- a person answering the telephone instead of an answering machine;
- uniformed employees;
- equipment painted the same color but not necessarily new;
- a regular business location, particularly an office on a heavily travelled street for good exposure.

Developing a focus
To develop a marketing focus, Proudfoot advocates using existing resources. Several times during the year a Roundtable of Customers is invited to a dinner meeting and asked to evaluate the services of the firm. Telephone surveys are another useful marketing tool. For example, the office manager calls recent customers and asks a simple question—"What didn't we do that we should have done?"

Thank you cards are dynamite. Customers really like to receive them. Ask for referrals from customers. When you do tree work at one residence, go next door and introduce yourself and your firm, and leave a business card.

Press releases are another marketing avenue. Take a firm fact sheet to the local television and radio stations and offer your assistance should any tree-related issues become newsworthy. Update this information every six months.

Having an open house a couple of times per year also generates interest. It should be like a military inspection and handwritten invitations to the open house are very effective.

Another effective marketing event is to have a company picnic in a local public park. For use of the park, offer to prune several trees free of charge. Attractive hats and T-shirts bearing the company name can be worn by all the employees.

One unusual marketing method highly recommended by Proudfoot is to speak to kindergarten children. He makes it a point to book two kindergarten engagements per year.

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Soil pH And Nutrient Availability

By Peter Gerstenberger
Editor

A soil’s pH value is a measure of the relative concentration of positively charged hydrogen (H+) ions and negatively charged hydroxyl (OH−) ions. A pH of 7.0 means that the concentrations of H+ and OH− are equal and that the soil solution is neutral. A pH below 7.0 indicates a higher concentration of H+ and an acid soil, while a pH above 7.0 indicates a higher concentration of OH− and an alkaline soil. When making fertilization recommendations, it is important for the arborist to know the soil pH because pH directly affects soil nutrient availability.

The presence of a nutrient element in the soil is no guarantee of its availability for absorption by the plant. The concentration of H+ and associated ions affect soil reactions and the formation of soluble and insoluble compounds. Each nutrient has a pH range of maximum availability, simply because it forms a large proportion of soluble compounds in that range. This relationship is illustrated in the table on the next page.

For most plants, the conditions of nutrient availability are best near a pH of 6.5; in other words, in a slightly acid soil. So-called acid-loving plants like rhododendrons, azaleas and pines require comparatively large amounts of elements that are more available in an acid soil, one with pH 5.5.

In some cases, nutrient availability can be improved by altering the soil pH. Sulfur is used to lower the pH (raise the acidity) and agricultural lime is used to raise the pH (lower the acidity). It is best to consult with a local soils specialist who can tell you the feasibility of changing the pH of the soils in your area and prescribe sulfur or lime application rates. Keep in mind that the fertilizer formulation you use may alter pH.

Soil pH testing is critical for effective treatment of tree nutrient deficiencies and should be a routine part of your company’s tree fertilization program. Equipment for pH testing is readily available from arborist supply houses.
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New Proposals
Feds Busy With A Variety Of Measures

By Robert Felix
Publisher

Congress, the Occupational Safety and Health Administration and the Department of Labor have been busy recently on a number of measures relating to the tree care industry.

Two bills are particularly worthy of note—one dealing with pesticide applications and one addressing victims' rights.

A bill recently introduced by Sen. Joseph Lieberman (D-Conn.) would require that anyone applying pesticide, whether for private or commercial use, be certified and keep records of all pesticide applications.

Certified applicators would be defined as those who use all registered pesticides. To be certified, applicators would have to prove proficiency in integrated pest management and sustainable pest control methods.

A bill recently introduced by Sen. Joseph Lieberman (D-Conn.) would require that anyone applying pesticide, whether for private or commercial use, be certified and keep records of all pesticide applications.

The Victim's Rights Bill would give families of workers injured or killed in an occupational accident the right to be involved in investigations conducted by OSHA.

The bill was filed in the House by Rep. Charles Hayes (D-Ill.). A companion bill, filed in the Senate by Sen. Paul Simon (D-Ill.), would give families of persons killed in occupational accidents and workers injured on the job the right to be briefed by OSHA before any citations are issued. Victims and their families also would be given the right to participate in OSHA hearings and any settlement agreement. In addition, Simon's measure would provide copies of citations and investigative reports issued by OSHA.

Directive from OSHA

In a related action, OSHA recently issued a directive outlining the agency's procedures for involving families of occupational accident victims in investigations of the incidents. The directive, issued to all regional administrators and area directors, says OSHA will provide "timely and accurate information" about its investigations. That information will include a description of the scope and purpose of any investigation; an outline of OSHA's civil enforcement process, including the agency's standards, citations and penalty system; and an explanation of the kind of information available under the Freedom of Information Act. Upon request, OSHA also will provide a free copy of the citations if any are issued.

Despite the new directive, OSHA Administrator Gerard F. Scannell says that OSHA could not support Simon's bill, which would permit family members to take part in conferences between investigators and employers over the amounts of fines levied for workplace safety violations.

Scannell might agree to a compromise that would allow families to make a presentation at such conferences, however.

The measure, Simon said, was not a criticism of Scannell and Labor Secretary Elizabeth Dole, who the senator said were "sympathetic to injured workers and their families." Rather, the amendment, which was cosponsored by Sens. Howard Metzenbaum (D-Ohio) and Edward Kennedy (D-Mass.), was being offered to ensure that such an attitude would continue as part of future policy, Simon said.

DOT regulations

Besides keeping an eye on this bill, employers should be aware of changes in Department of Transportation regulations that went into effect July 1. Under the guidelines, all vehicles over 10,000 pounds gross weight that travel between states must be inspected at federal inspection areas. Drivers must display their inspection stickers on the vehicle, or have the inspection certificate on board. It is advisable to do both.

Inspections cover the following: brake system, coupling devices, exhaust system, fuel system, lighting devices, safe loading, steering mechanism, suspension, frame, tires, wheels and rims, windshield glazing, and windshield wipers.

The following states are in compliance with the federal regulations: Maine, Maryland, Michigan, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, West Virginia and the District of Columbia.

Finally, employers should be aware of legislation adopted by their home states regarding medical and parental leave. Although President Bush vetoed the Family and Medical Leave Act in late June, 24 states have enacted legislation dealing with the issue. Employers should check with their state officials to find out what their responsibilities are regarding leave policies.
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How Do You Sell Fertilization?

By Tom Clancy
TCI Staff

A newsletter or other brochure is the most common method of promoting tree fertilization, according to an informal survey conducted by Tree Care Industry magazine. The literature typically includes benefits of fertilization, which is commonly sold as part of an overall tree care program or in conjunction with another service, said representatives of five companies surveyed.

“We send out a promotional piece of literature that talks about fertilization as part of an overall tree care program,” says John Landon, general manager at General Tree Service, in Clackamas, Oregon. Tree fertilization, which is included as part of the company’s insect and disease prevention program, accounts for about 6% of the firm’s sales.

Chris Frank, president of C.L. Frank and Company, in Northampton, Massachusetts, says his newsletter helps “to better get the message across to our customers.” Frank says fertilization makes up about 5 to 8% of his company’s sales.

In general, clients are receptive to the idea of fertilizing their trees, says Steve Geist, a pathologist at Swingle Tree Service, in Knoxville, Tennessee, says he also uses the Mauget systemic method. Cortese says his company sells fertilization with pruning jobs. Cortese says his company sells fertilization with pruning “probably three out of four times.” Low Country Tree Care takes a similar approach, but offers fertilization as a separate item on the bill.

The responding companies also said they remind their customers of the need to fertilize regularly. Landon notes, “We use less nitrogen in our program so we fertilize every 10% of the company’s gross sales. “You look for the weakened tree,” Prosser explains. “You explain to the tree’s owner that there is something going on with the tree, that it is either missing something or losing something.”

Apparently, the strategy works and the program sells itself, according to Prosser.

Rainbow uses a combination of 10 elements, with 70% slow-release.

It’s Not Tree Fertilization, It’s Root Care

Rainbow Tree Company of St. Louis Park, Minnesota, has established itself as a leader in tree fertilization. The company’s success can be attributed to president Tom Prosser’s philosophy that Rainbow is not providing tree fertilization but rather complete root care.

“We explain to the customer the stresses that the tree is under and then promote our program by the results we get,” Prosser says.

The program is targeted to a specific segment of the tree care market and accounts for approximately 25% of the company’s gross sales. “You look for the weakened tree,” Prosser explains. “You explain to the tree’s owner that there is something going on with the tree, that it is either missing something or losing something.”

Apparently, the strategy works and the program sells itself, according to Prosser.

Rainbow uses a combination of 10 elements, with 70% slow-release.

The materials are placed around the tree in a grid fashion every 2 1/2 feet using high-pressure liquid injection. The holes are larger than necessary to provide better aeration.

The soil in Minnesota is generally alkaline, but Prosser has developed a way to combat this. “We use a sulfate of potash that lowers the pH below 7, which creates better soil conditions for the roots to grow,” he says. “Our clients are on a two-year schedule. Our fertilizer is very low in salt concentration. We mix the materials right on the truck. There is a vat that hangs on the bed of the truck and is connected to the tank. The materials are mixed together by this process.”

The program has been profitable for Rainbow. While it is admittedly different from the traditional process, clients are satisfied with the results, making the next job easier to sell.

—Tom Clancy
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Salt In Fertilizer

By Patrick Kelsey

Fertilizers are comprised of salts, whether they are organic or inorganic. A salt is a chemical that is formed by the replacement of an acid hydrogen ion with an elemental metal. For example, in table salt the hydrogen ion is replaced by sodium to yield sodium chloride from hydrogen chloride. Inorganic salts commonly encountered in fertilizers include ammonium nitrate, diammonium phosphate and potassium chloride. Urea formaldehyde is a common organic salt used in fertilizer. Salts of all types, including those in fertilizers, exhibit a number of chemical properties that influence plants.

When fertilizers are applied to the soil, they make the soil more saline. The more saline a soil becomes, the more its osmotic pressure rises. Osmotic pressure is the pressure required for soil solution to diffuse through a semipermeable membrane, such as a root hair. In the life of a tree, this may mean that water is prevented from entering the roots and may even be drawn out, causing root damage.

The salt index for a fertilizer is the increase in osmotic pressure of the nutrient salt in question to that produced by the same mass of sodium nitrate. The salt index value is a relative value. The table below shows the analysis (percent of actual nutrient in the fertilizer) of several fertilizer components and their relative salt index. In general, as the analysis increases, the partial salt index decreases. Thus, you would expect higher analysis fertilizers to produce less salt injury in plants than lower analysis fertilizers because of their lower solubility in water.

The salt index of the fertilizer being applied is not the only factor involved in salt injury to trees. It is merely a chemical means of assessing the relative salt content of a fertilizer. Care must be taken to evaluate not only the fertilizer to be used but also site conditions, including soil texture, structure, drainage, levels of deicing salts received by the tree to be fertilized, and salinity of irrigation waters, where appropriate.

Patrick Kelsey is a research soil scientist in the Urban Vegetation Laboratory at the Morton Arboretum, Lisle, Illinois.

<table>
<thead>
<tr>
<th>Fertilizer</th>
<th>%N</th>
<th>%P₂O₅</th>
<th>%K₂O</th>
<th>Salt Index</th>
<th>Partial Salt Index*</th>
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<tr>
<td>Ammonium nitrate</td>
<td>35.0</td>
<td>-</td>
<td>-</td>
<td>104.7</td>
<td>2.99</td>
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<tr>
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<td>-</td>
<td>69.0</td>
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<td>-</td>
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<td>-</td>
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<td>2.45</td>
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<td>-</td>
<td>-</td>
<td>34.2</td>
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<tr>
<td>Superphosphate</td>
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<td>34.6</td>
<td>8.4</td>
<td>0.24</td>
</tr>
</tbody>
</table>

* Calculated per unit of N, P₃O₅, K₂O
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Risky Business
Non-union Employers Face Increasing Risks Over Terminations

By Steven Semler

Almost all employers in unionized companies are subject to contracts which allow arbitrators to determine if there is "just cause" to sustain an employee's termination. These arbitrations are becoming more frequent because the Supreme Court has ruled that the terminated employee can sue the union in federal court for "breach of the union's duty of fair representation." Thus, unless the union feels the employer has an air-tight case, it increasingly will seek arbitration—perhaps not so much to help the terminated employee as to protect itself from a "fair representation" claim.

Does this mean that a non-union employer won't be sued for terminating employees? Not by a long shot! In fact, non-union employers face even greater exposure because the union employee's suit frequently can be forced into arbitration where the maximum remedy is reinstatement and back pay. But since the non-union employee is not subject to collective bargaining agreements, he can go right to court and sue for sundry indignities for which a jury may award hefty damages. In California, for instance, such law suits increasingly return $250,000+ verdicts!

Why suits have increased

From employers' perspective, courts seem to be falling over themselves to encourage such law suits against non-union employers. Historically, non-union employers largely were free of such law suits because the employment relationship was "at will"—meaning either party could end it whenever it cared to and without liability. The courts, however, have substantially undermined the "employment at will doctrine" by creating exceptions to it.

Foremost among these exceptions is the "implied contract" theory. In essence, this exception says that an employer's policy statement—such as an employee handbook which refers to "permanent" (as opposed to "probationary") status, is said to give rise to implied contract rights of the employees to sue for breach of a "covenant of permanent employment." Similar exceptions even have been crafted from handbook references to a guarantee of "fair treatment" or, worse yet, from oral representations to an employee. Sometimes terminated employees refer to conversations with their employers in claiming breach of an oral contract for lifetime employment subject to "just cause" grounds for dismissal.

In addition to these "implied contract claims," the courts also are allowing employee-plaintiffs to add on to these suits separate claims for violation of personal rights, known to lawyers as "tort" claims. Say, for example, an employee is fired on the shaky assertion of "stealing," and his former boss reports that "fact" when asked by a prospective employer in a reference check. The terminated employee could tack on a "defamation" claim. Similarly, if the former employer went around broadcasting that "John Jones is a thief," Mr. Jones also might tack on a claim for "intentional infliction of emotional distress." The costs for legal defense in these suits is extraordinary. The rub is that, while these costs are recoverable in tort cases, that is where the six-figure verdicts usually arise.

Employers' checklist

Still, non-union employers can take measures to help protect their companies against these suits, particularly the "implied contract" claims. Here is a short checklist:

—Have corporate labor counsel prepare a provision to be placed or the job application stating that the applicant agrees that the employment relationship is "at will" and that the relationship will not change unless expressly stated in a letter to the employee signed by the president of the corporation.

—Have corporate labor counsel carefully go through your employee handbook and personnel guidelines, memoranda, rules, etc., and delete all the "buzzwords" which are red flags used to fuel implied contract claims.

—Include a disclaimer, drafted by corporate labor counsel, prominently displayed in the foreword to your employee handbook, stating that...
nothing in it is, or is intended to amount to, a written or implied contract of employment.

—Include information in the handbook again stating that the employment relationship is “at will” and either party may terminate it without cause and without having to use any particular procedure.

—Have employees sign receipts for the handbooks.

—Instruct supervisors and clerical workers not to give any employment references to any caller. Their response should be, “Our policy is only to confirm the dates of employment and job classification.”

—Confine adverse comments about the reasons for a termination to those in the company who need to know.

These steps must be implemented as a comprehensive package; piece-meal steps will buy trouble. While no set of steps is bulletproof, we have seen more than one plaintiff’s attorney walk away from suing a suitably protected company.

Of course, the foregoing can’t guarantee terminations won’t be contested, such as a termination for supporting a union, which is an NLRA violation, or EEOC-type violations, such as claims of discrimination based on age, sex, race, religion, etc., but it is a start.

Thus, while tree care employers face the same risks as other employers, there is much that can be done to protect corporations from law suits which have the potential of crippling the company.

Steven R. Semler is a partner in the Washington, D.C. law firm of Semler & Pritzker, which is labor law counsel to the National Arborist Association, and several corporations in the tree care industry.

This column should not be taken as legal advice for particular situations, which only can be given by the reader’s own labor counsel.

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TREE CARE INDUSTRY - AUGUST 1990
Fertilizer Debate
An Old Practice Still Stirs Controversy

By H. Dennis P. Ryan III

Fertilizing trees is not a new practice. The ancient Greeks were fertilizing trees and the English were using liquid fertilizers in the 1600s. Tree fertilizing was probably controversial then and it definitely can cause debate now whenever arborists gather. One only has to ask when to fertilize, how much to use or what method to use in order to get a lively discussion going.

Today's arborist often has a difficult time selling tree fertilizing to a client. The client sees the trees in the woods across the street growing beautifully and doesn't understand why the trees between his house and his driveway need to be fertilized.

Many trees growing in our yards, parks and under other stressful conditions will benefit from a proper tree management program, and fertilizing should be a part of many of these programs.

Why fertilize?

Trees growing in the urban environment are not growing under the same conditions as their country cousins, even if they are only a short distance apart. In addition to the normal biological and climatic problems, urban trees are also subjected to PPD (People-Pressure-Disease). PPD includes mechanical injuries to the trunk, air pollution problems and many types of root stress. The installation of new curbing or pipes and soil compaction are serious threats to the health of local trees.

Plant roots have two basic functions. First, they support the upper portions of the tree, thus exposing the leaves to sunlight for photosynthesis; and second, they take in soil moisture as well as the nutrients dissolved in the soil solution. These chemicals are required to carry on the various physiological activities of the plant. The respiration process may also be affected by covering the roots with more soil. This problem is prevalent around new homes where the soil depth has been increased. The addition of asphalt, concrete, or more than a few inches of soil will change the amount of moisture, nutrients and oxygen available to the roots.

In most cases, the trees that are suffering from PPD stresses produce symptoms similar to those of other diseases. One symptom, an increased metabolic rate, places a severe stress on the plant, which must be given serious consideration when diagnosing tree problems.

Metabolism can be defined as the sum of the anabolic and catabolic processes carried on by plants. The anabolic phase may be considered the “building-up” process of the plant. The catabolic or “tearing-down”-phase of metabolism includes the processes of respiration, fermentation and digestion.

The two most important examples of anabolic and catabolic processes are photosynthesis and respiration, respectively. Although these are often discussed separately, they are going on at the same time in the plant.

Photosynthesis takes place only in the presence of light, while respiration is carried on day and night. Respiration may be defined as oxidation of foods in living cells resulting in the release of energy. Foods for plant respiration are synthesized by the tree and not taken in from the soil. For the survival of the plant, sufficient food must be produced by photosynthesis in order to have it available for respiration. Unless food...
production exceeds respiration requirements, the plant cannot continue to live.

In addition to absorbing plant nutrients, roots are also important in maintaining a proper water balance in trees. The main component of protoplasm is water and if sufficient moisture is not maintained in the plant, desiccation will kill the protoplasm. Water is also used by the plant as a medium for transporting nutrients and other soluble materials throughout the tree.

When catabolic functions exceed anabolic activity, the vegetation declines in vigor. Decline symptoms often begin as a mild chlorosis that starts in the upper crown and involves only part of the tree. Foliage thinning and a reduction in leaf size with smaller leaves found at the top of the tree are also symptoms of a decline in tree vigor. Following these initial symptoms, dieback of the smaller branches begins and progresses down the tree. Suckers then appear on the primary branches. This decline process may be rapid, starting one or two years after the initial damage, or it may be prolonged over a 20-year span due to a plant outgrowing a site.

Arborists should work with contractors, government agencies and homeowners to prevent tree damage of this type. But, in many cases, the arborist is not called onto the site until after the problem has begun to develop.

There are ways to control and counteract many of these problems, but the problem must be identified early and acted on promptly. Soil compacted by construction or just foot traffic can be loosened and the area can be covered with wood chips. In many cases a fertilizer program can be started that will benefit the plants.

The normal tree

Prescribing a fertilization program that will produce results requires an understanding of the “normal tree.” An arborist trying to identify a nutrient deficiency must know “what the tree is supposed to look like.” Leaf color, size, twig growth and general appearance must be understood. With the appearance of the normal tree in mind, the arborist can then determine if a tree has a deficiency problem.

Twig growth is a good indicator of plant growth and can be looked at any time of the year. The arborist with normal growth patterns in mind can look at the terminal bud scars to determine growth during the past several years. Is the growth “normal” or is it getting shorter each year? If it continues to get shorter, fertilizer may help.

During the growing season, leaf/needle color, size and appearance can be used to identify nutrient problems.

What is fertilizer?

Fertilizer is a supplement, usually added to the soil, (but can also be applied to the foliage or injected into the tree) composed of elements essential or beneficial to tree growth.

There are 13 elements required for plant growth that are obtained from the soil. These are divided into two groups:

<table>
<thead>
<tr>
<th>Macro</th>
<th>Micro</th>
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<tr>
<td>nitrogen</td>
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<tr>
<td>phosphorus</td>
<td>manganese</td>
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<td>sulfur</td>
<td>molybdenum</td>
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Arborists in most cases work with nitrogen, phosphorus, potassium and, in some locations, magnesium and iron. During the last few years the types of fertilizers available to arborists have changed dramatically; the old classifications of organic and inorganic are now more complex.

Today, in addition to organic and inorganic, we have synthetic organics which can be either fast- or slow-release, liquid or dry. Rather than trying to understand the fertilizer classifications, the arborist should learn how to interpret the fertilizer label.

The fertilizer label

The first thing that the arborist must realize is that most of the information on a bag of fertilizer is advertisement. The only information on that bag that is required by law is the guaranteed analysis—the percent of nutrients, speed of availability and the pH reaction.

Nitrogen, phosphoric acid and potash are commonly supplied to the soil by arborists. The three numbers found on a bag of fertilizer refer to the percent of those elements in the bag. The numbers are always in the same sequence. The bag of fertilizer in the diagram has 10% nitrogen, 6% phosphoric acid, and 4% potash. These numbers refer to percent, and not parts or pounds. If a fertilizer has only one of these nutrients present, it is still written the same way. For example, 0-20-0 means that a particular...
fertilizer contains no nitrogen or potassium, but it does contain 20% phosphoric acid.

The fertilizer's speed of availability can be confusing. In the past, all fertilizer fell into two major categories of availability: natural organic (slow-release) and inorganic (fast-release). This is now confused by synthetic organic, which can be either fast- or slow-release. Note in the diagram the 4% W.I.N. and 6% W.S.N. The W.I.N. stands for Water Insoluble Nitrogen and W.S.N. for Water Soluble Nitrogen. The higher the percentage of W.I.N., the slower the nitrogen release. Thus, in our diagram, 40% of the nitrogen in the bag is slow-release.

Example:

\[
\frac{4\% \text{ W.I.N.} \times 100}{10\% \text{ N in bag}} = \frac{400}{10} = 40\%
\]

A 20-10-10 fertilizer with an 8% W.I.N. would also have 40% slow-release nitrogen.

Rather than looking for the word organic on the label, get into the habit of reading the guaranteed analysis. The W.I.N. or W.S.N. percent will give you the necessary information.

The last item on the label is the potential acidity. Many fertilizers will make the soil more acid (lower in pH). In order to avoid this when using an acid-forming fertilizer, again you must read the label. In our diagram, we have a potential acidity of 1000 pounds of calcium carbonate (lime) per ton. In other words, for every ton of this fertilizer used, you must add 1000 pounds of lime in order to keep the pH the same. This will compensate for the acid-forming fertilizer. Another way of saying this is, if the pH of the soil was 6.0 before fertilizing, you would have to add a half pound of lime for every pound of fertilizer used in order to keep the pH at 6.0. While this is not commonly done by arborists, it should be.

**Conclusion**

Tree fertilizing has a place in a well-managed tree care program. The arborist must understand not only the tree but the entire site. Today there is a great deal of controversy brewing outside of arboriculture regarding the use of fertilizers, especially nitrogen. Several government agencies are considering limiting the use of fertilizers. In light of these developments, you should be knowledgeable about the proper use of fertilizer and its effect on the tree and the environment.

Dr. H. Dennis P. Ryan III is a professor of arboriculture at the University of Massachusetts at Amherst, Stockbridge School of Agriculture.

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ISA Provides Input To Congress On Research Funding

While there is considerable interest on the national level for increased tree planting efforts, ISA officials recently provided input to Congress and the Department of Agriculture on the importance of increased funding for research on urban trees.

President Bush’s “America The Beautiful” program proposes $175 million be allotted for the planting of new trees. However, initial budget documents indicated that a decrease in research funding was proposed.

In its statement to Congress, the ISA said, “There is a positive correlation between the number, size, health and placement of trees and their ability to help solve the environmental problems facing us. If we are to attain the maximum benefits of the President’s proposal, it is critical that we not only plant trees, but assure their continued maintenance. Through urban tree research, we must also learn more about ways to preserve and enhance our investment.”

The ISA statement also said that research “must involve the generation of new basic scientific information that will provide innovative, cost-effective tree selection and maintenance techniques which will assure our urban trees attaining biological maturity instead of succumbing to adverse urban conditions.”

The ISA has continued to provide input into the budget process and will continue to provide updated information on the progress of its efforts.

TCI Next Month . . .

The September issue of TCI will be devoted to equipment. TCI will research the origins of modern day equipment. Arborists will be given valuable advice on whether they should lease or purchase their next piece of equipment. They will also receive tips on buying new versus maintaining old equipment, and they will read about what’s “hot” in equipment.

All this in addition to the regular TCI features will make the September issue one you’ll want to keep.

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Please circle 7 on the Reader Service Card
National Center To Be Built At Birthplace Of Arbor Day

Congress passed and President Bush signed into law a $5.9 million appropriation to create the National Arbor Day Center, the only education center of its kind in America with staff and programs dedicated to tree planting and conservation. The National Arbor Day Foundation must now match the appropriation for the $12.1 million National Arbor Day Center with nonfederal funds.

The new Institute will be dedicated to closing the gap between what is known and what is practiced in the areas of tree planting and care, conservation, and environmental stewardship.

The Institute will develop and sponsor continuing education, professional development, and conference programs for the men and women on the "front line" — the conservationists, members of city tree boards, mayors, zoning administrators, contractors, farmers, developers and others — who ultimately decide the fate of our nation’s trees.

The Institute will also convene conferences of leaders and experts from around the world to exchange information and engage in collective problem solving on issues of environmental concern.

Much needs to be done, and the Foundation is seeking the help of members, foundations, corporations, and other friends in matching the government’s appropriation.

For further information, write to The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, Nebraska 68410.

A Word About TCI

TCI is mailed to more than 16,000 arborists every month. It is published by the National Arborist Association, whose members are the recognized leaders in the practice of commercial arboriculture. TCI also draws upon the ISA, ASCA, and other professional arborist organizations in the mainstream of arboriculture.

Would you like to be in the mainstream? Getting TCI every month and staying informed is a big step in the right direction. If you do not receive a personal subscription to TCI, use the subscription form in this magazine to get started. Do it today!
Powerful Problems/Growing Solutions

The International Society of Arboriculture Research Trust announces the release of a new VHS videotape titled "Powerful Problems/Growing Solutions." This 12-minute video addresses the problem of reconciling a reliable supply of electric power with the desire to preserve and protect the aesthetic quality of tree-lined streets in our communities.

The video examines problems encountered in tree-utility line conflicts and sensitizes the utility companies and communities to the concerns of each party. The importance of working together to preserve a community resource and solve a community problem is emphasized throughout the presentation. The video also establishes the importance of utility companies employing arborists or foresters on their staffs.

The program was developed by Chief Forester William Wheeler, of the Louisville Gas and Electric Company, in conjunction with an independent horticultural expert, Mark Timmons.

The tape is an educational tool to be used by professionals as an aid in presentations to citizens groups, city officials, utility companies and others concerned with tree/utility conflicts.

The video may be purchased for $25 (U.S. funds) from the ISA Research Trust. When ordering, please identify the video by title. Send check or money order to: ISA Research Trust, P.O. Box 908, Urbana, Ill. 61801.

Arborists Plan Annual Meeting

The American Society of Consulting Arborists will hold its Annual Meeting October 25-27 at the Innisbrook Resort in Tarpon Springs, Florida. The meeting features an outstanding speaker program, including:

- Tree Planting Specifications—Dr. Ed Gilman, University of Florida;
- Treatment of Pine Foliar Chlorosis—Dr. Roger Webb, University of Florida;
- Vision and Revision of Williamsburg Gardens—Gordon Chappell, Colonial Williamsburg;
- ASCA's Role in the Story of Trees—Derek Burch, Consultant, Fort Lauderdale;
- The Filled Oak Story, A Follow-up—Gary Doyle, Consultant, Vero Beach;
- We're All in This Together—Ann Miller, M.A.U.F.S. president;
- Urban Horticulture, Plans for Cities—Dr. Harold B. Tukey Jr., University of Washington;
- Moving the Circus Trees—Michael Bonfante, Consultant, Gilroy, California;
- How We Work Together—Ken Simon and Don Willeke, Minneapolis.

Special attractions of the resort area include golf, fishing, and a relaxing environment. For more information, contact Jack Siebenthaler at ASCA, 700 Canterbury Road, Clearwater, Florida 34624. Phone: (813) 446-3356.

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TREES CARE INDUSTRY - AUGUST 1990 29
The International Society of Arboriculture has elected three new officers to serve a one-year term, beginning this month. The new officers are Dr. Donald Ham, president; Roger Garrigue, president-elect; and John Moran, vice president.

Dr. Ham has been active on the ISA Board of Directors and is working on video and education brochure development for the ISA. He brings educational, consulting and commercial arboricultural experience to his position. At Clemson, he has developed and teaches the only course in arboriculture. He has been active in the ISA since 1971 and has served as Southern Chapter president as well as two terms as Chapter representative to the ISA Board of Directors. He has also served as the chairman of the Publications Committee and as a member of the Journal of Arboriculture Editorial Board.

Garrigue has been involved in arboriculture since 1948 in the Philadelphia and Los Angeles areas. As an ISA member since 1969, he served on nearly all the Western Chapter committees and served as its president in 1979 and secretary-treasurer from 1982-1988. He served on the Chapter Executive Board for 14 consecutive years. For the last 20 years, he has been instrumental in increasing the membership of the Western Chapter, in meeting or exceeding all ISA Research Trust Fund goals and initiating a program designed to establish a meaningful relationship between the public and the ISA.

Active in arboriculture for over 20 years since his graduation in 1969 from the Stockbridge School of Agriculture, Moran has just formed his own tree care business, Arbor Care, Inc., in Hartford, Connecticut. Previously, during his 18-year association with Alpine Tree Care, Inc., in White Plains, New York, he served as senior vice president. He has been active in the ISA for more than 20 years. As a member of the New England Chapter, he has served on the Chapter Board as program chairman, membership chairman and Research Trust Fund chairman. He is a past president of the New England Chapter and has just completed eight years as Chapter representative to the ISA Board.

What is your future impact?

Make a greater impact on tomorrow by joining the International Society of Arboriculture today.

I.S.A. is a professional society dedicated to making a difference for the future now by proper tree care and preservation. The Society provides services to its members regarding the science and art of growing and maintaining shade and landscape trees. As a member you enjoy a variety of services including a monthly publication, The Journal of Arboriculture, research papers, educational brochures and videos, a computer database titled ARBORBASE and much more. In addition to all these services, I.S.A. will introduce you into a network of one of the largest tree care societies in the world!

I.S.A.'s services and objectives are aimed at making your public more aware of what you do as a professional of the garden and landscape industry. It will also help you do your job better. We encourage you to consider joining over 4600 other professionals as we strive to impact the future today. Be a part of this growing effort to promote a better tomorrow through research and public education in the planting and preservation of landscape trees and shrubs.

For more information and an application write or call:
International Society of Arboriculture
Leal Park, 303 W. University Ave.
P.O. Box 908, Urbana, IL 61801
(217) 328-2032 or 1-800-ISA-TREE

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TREE CARE INDUSTRY - AUGUST 1990
Sierra Moreno Mercantile introduces the Samurai line of arborist saws, described as the fastest and smoothest cutting saws in the world. Featuring the most complete range of sizes, the Samurai is the only one offered in a 22-inch size. Available exclusively from Sierra Moreno Mercantile and authorized dealers. For further information, contact Sierra Moreno Mercantile Company, P.O. Box 292, Big Pool, Maryland 21711, or call (301) 842-2544 (FAX-301-582-3639).

Windmill introduces its Model 540BT backpack power blower. The new blower is powered by a 40cc Kawasaki engine with solid state ignition, diaphragm carburetor and a large bottom mounted fuel tank. It also features a full anti-vibe system, telescoping throttle road assembly, cushioned shoulder pads with braided nylon straps and a new larger nylon frame with a "comfort-ribbed" back cushion. For further information, contact Vandermolen Corp., 119 Dorsa Ave., Livingston, N.J. 07039-1092.

Why climb when you don't have to? The Malbo Corporation has designed and patented an extendable pruner, extendable chain saw and extendable hedge trimmer that save time and energy. All are mounted on sturdy fiberglass poles and run with compressed air to do the job effectively, efficiently and economically. The equipment is extremely lightweight: the saw weighs only 4 1/2 pounds, the 2 1/2-inch pruner only 4 pounds.

Tree Fertilization Workshops

Tuesday, October 16, 1990  Wednesday, October 17, 1990
The Holden Arboretum  Radisson Hotel
Cleveland, Ohio  Columbus, Ohio

Thursday, October 18, 1990
Proudlake Recreation Area
Milford, Michigan

Faculty: Dr. Elton Smith, Dr. Terry Tattar, Mr. Lauren Lanphear

Cost: $80 when you pre-register, $95 at the door. When more than one person from a firm pre-registers, additional registrants get in for $72.

Tree fertilization is one of the most profitable and beneficial services offered by arborists. National Arborist Association day-longTree Fertilization Workshops bring industry experts together to present "state of the art" information and hands-on demonstration. Material is presented from the perspective of the scientist as well as the practicing arborist. For more information or to register for this important meeting, call the NAA at (800) 733-2622.

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Bandit Industries announces that the Model 90, 9-inch diameter capacity Brush Bandit Chipper is available with three new power options. The options are: the 37-hp, V-412 Wisconsin gasoline engine; the 41-hp, air-cooled, F3L1011 Deutz diesel engine; and the 35-hp, air-cooled, 2M40 Hatz diesel engine. The 90 will chip up to 9-inch diameter material and has the same power feed system that is used on Bandit’s 12-inch capacity Model 200+. The 90 is equipped with a 360-degree swivel discharge and feeds material at 90 feet per minute. For further information call or write: Bandit Industries, Inc., 6750 Millbrook Road, Remus, Mich. 49340, 517-561-2270.

Homelite introduces its AP-125 water pump weighing only 9 pounds. The pump can be used for various applications because of its light weight, quiet operation and rugged two-cycle gas engine. It comes with 10 feet of 1-inch diameter suction hose, couplings, strainer and a garden hose adapter fitting for discharge. The pump will run for about 45 minutes on a tankful of fuel. It is available through home centers and hardware stores, lawn and garden dealers, and marine and sporting goods outlets. For further information write to Homelite Division of Textron Inc., Marketing Department, Box 7047, Charlotte, N.C. 28241.

TouchPoint Partnership announces a new training program using the personal computer to help train your field employees in job and safety skills. TouchPoint develops training programs that simulate actual on-the-job situations. Called Computer Based Training (CBT) this method of training uses animation, graphics, sound, text and video to present concepts and scenarios to the learner. Concepts such as pesticide application, worker safety, and other tree care techniques can be converted to CBT for use on IBM or Macintosh personal computers. For more information contact Bruce Wilhelm, TouchPoint Partnership, 3131 S. Vaughn Way, Suite 134, Aurora, Colo. 80013. Phone: 303-750-6262

Grow Gun Corporation recently introduced a new product—the Grow Gun Probe. The probe comes in three sizes—Grow Gun Probe, Junior Probe and Mini-Probe. The probes are light, hand-held tools that provide a convenient method to inject fertilizers, water and air to the root systems of trees and shrubs. It can also help in the treatment of lawn diseases such as fairy ring. The probe can be used in very tight quarters. Through its gravity-fed hopper, the 1-inch probe can handle sand-size particles such as granular and powdered fertilizers. Injecting polyacrylamides will help reduce watering, which is beneficial in areas experiencing drought conditions. Using an 8 CFM air compressor, an area 4 to 8 feet in diameter from the probe tip can be fractured, aerated and soil amendments distributed.
VC Marketing, Inc., introduces its expanded line of Wood-Pro disc brush chippers. The new disc chippers feature heavy-duty bearings, solid 20-inch and 24-inch steel discs, and easy access cutter housings. Limbs up to 3 inches in diameter are handled with ease. Maximum chipping capability is approximately 5 inches. These highway towable chippers compact and allow for easy one-man operation. For further information, write to VC Marketing, P.O. Box 608, Roseland, N.J. 07068.

Vermeer Manufacturing Co. has introduced the Vermeer 9400 Tree Spade, capable of digging and transplanting large trees with a 94-inch diameter tree ball. The unit features a heavy-duty hydraulic drive system with chain reduction assist. Four huge spoon-shaped spades form a round 94-inch diameter ball that reaches a depth of 65 inches. The front of the truck bed holds approximately 450 gallons of water, which lubricate the tree ball and spades during the digging process. The entire tree digging and lifting operation is hydraulically controlled from a single operator station located next to the spades for maximum visibility. For further information, contact Vermeer Manufacturing Co., P.O. Box 200, Pella, Iowa 50219 or call at 515-628-3141.

Swedish chain saw manufacturer Jonsered Motor AB has introduced its latest model, the 2094 Turbo. The new saw has a displacement of 94 cc’s and features Jonsered’s unique centrifugal intake air cleaning system, or DCS (Dust Control System). With the new 2094 Turbo, intake air is cleaned 99.9% pure before reaching the air filter. The new DCS system also means improved fuel economy, lower emissions, less wear on mechanical components and full-power for a longer period. The engine also runs cooler than any other model. Other features include a fully adjustable oil pump and an inertia-activated chain brake. For further information, contact Jonsered Importer and Distributor, Tilton Equipment Co., Dept. RPM. P.O. Box 68, Rye, N.H., 1-800-437-6643 (N.H. 1-800-322-0244).

Spotlight Industries introduces clear glasses for the arborist, offering eye protection in optically correct eyewear without distortion. The glasses are wrap-around, providing side protection without hindering peripheral vision. The glasses are shatterproof, meet ANSI standards and totally block ultra-violet radiation. They can be worn over regular glasses and are constructed to minimize fogging. Smoke, amber and yellow tints are also available. Naugahyde carrying case included. For further information, contact Spotlight Industries, 31635 Blue Meadow, Westlake Village, Calif., 91361, or call 1-800-345-5243 or 818-706-1945.

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TREE CARE INDUSTRY - AUGUST 1990 33
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- Operations Manager: California, is responsible for three branch offices to include: scheduling, personnel development and support services. EOE.

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Safety Conscious
—Or Unconscious

By Tom Shotzbarger

"Why me?" I mumbled, staring at the newly posted list of topics for our weekly tailgate safety meetings. June 12th—LIFTING SAFELY—Tom Shotzbarger

The answer came quickly from over my left shoulder. "Because the only part of your body that you haven't damaged is your back." Becoming defensive, I challenged Les, my boss, that my accident record wasn't that bad. He just said, "This will be a good experience for you. It will raise your consciousness about safety."

All that day I nervously thought about standing up in front of the guys and making a fool of myself. "For 15 minutes, what would I do, what would I say?" I kept asking myself. Then I started to realize that what Les had said was true. I had been having a rash of small accidents lately . . .

Jumping off the bed of the truck, I landed on a pitch fork with tines up, getting clobbered smack in the middle of the forehead. Go ahead and laugh. If anyone had seen my performance I'm sure they would have been rolling on the ground with laughter. After telling the admitting nurse why I had come to the hospital, she responded, "Ah, does Tommy have a splinter? Why didn't you ask your Mommy to help you?" I faked a laugh at her mockery of me and felt vindicated when she helped the doctor extract a spine three-fourths of an inch long that was imbedded a half inch in the soft area in the middle of my kneecap. I guess I should have had on thicker pants or knee pads.

This next mistake was so stupid I hesitate to tell it, but here goes. What happens when you forget to wear eye protection? Right. You get something in your eye. What happens when you rub the eye instead of getting a solution rinse? Right again. You scratch your cornea and miss a couple days of work. Fortunately, the infection did not penetrate or I could have lost my vision.

A plan develops

Wow! Did I have a history of mistakes. But Les was right—I had never had any back problems. Maybe, just maybe, that was because lifting heavy objects was something I was doing correctly. In an attempt to prove my theory, I called the Workers Compensation Board, Blue Cross-Blue Shield and anyone else who would know something about proper lifting techniques.

Days later the brochures and pamphlets arrived, showing graphically that bending at the knees and not the waist is the proper method for lifting heavy objects. Great, I thought. My days of weight-lifting in high school helped me learn proper lifting techniques.

June 12 arrived and the meeting went well. We reviewed the brochures and everyone practiced lifting objects into the truck, like small logs, tool boxes and bags of fertilizer. There was no applause for me at the end, but in retrospect, I now applaud Les for helping me not only to capitalize on one of my strengths, but also to become more aware of areas where I needed to improve. Thanks, buddy.

Editor's Note: Toms Shotzbarger is employed by McFarland's Landscape Services, Inc. in Philadelphia.

Do you have a story for From the Field? TCI will pay $50 for published articles. Submissions become the property of TCI and are subject to editing for grammar, style and length. Entries must be submitted by field workers and must bear the name of the worker and his employer or they will not be considered for publication. Articles and photos must be received by the first day of the month for the following month's issue.
Arbor
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All the key suppliers of equipment, materials and services to the tree care industry will be at Expo '90. You'll see the most state-of-the-art equipment. You'll meet the key people behind that equipment and have a chance to talk with them one-on-one. You'll be able to make informed buying decisions; decisions that will increase the productivity and profitability of your operation. As an added bonus, the educational programs throughout the Trade Show will help you grow professionally.

You'll attend hard hitting seminars featuring world renowned arboriculture authorities, such as Dr. Alex Shigo, Don Blair, Walter Money, Dick Proudfoot, Tim Johnson and Erik Haupt. Plus, several opportunities to earn recertification credits at the pesticide applicator recertification seminars.

You'll exchange experience and knowledge with hundreds of your peers from all parts of the U.S., and enjoy the beautiful Richmond area. Just an hour away from Washington, D.C., Richmond offers a variety of activities from historical sights, to serene out-of-the-way dining, to an active and exciting night life.

This is the Expo everyone has been asking for... top speakers, a large and informative Trade Show with major exhibitors, an opportunity to network, and excellent accommodations in a beautiful part of the country. Don't miss these three exciting days!

Complete your TCI '90 Expo Registration Kit and mail today!
603-673-8952

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