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The 2300's compactness makes it look small, but looks are deceiving. See for yourself.

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# GOVERNMENT

## UPDATE

### Small businesses exempted from OSHA logs

Small businesses would no longer have to keep logs about occupational injuries or illnesses under an agreement reached in a congressional conference committee on the Small Business Authorization Bill.

Businesses with 10 or fewer fulltime employees would not have to keep the logs for the Occupational Health and Safety Administration unless the company owner was part of a survey of small businesses.

A committee staffer who worked on the bill said, "Businessmen should like this provision because we know they really hate to keep records."

Another provision of the amendment to the Small Business bill would prohibit OSHA from imposing civil penalties against a company with 10 or fewer fulltime employees on first-time OSHA inspections, which found 10 or fewer nonserious violations.

The conference committee report must be voted on by both houses and signed by the president before becoming law. Congress is expected to act on the legislation before the session recesses in October.

Although the amendment would limit some of OSHA's regulations, some congressmen felt the bill did not go far enough.

U.S. Sen. Dewey Bartlett (R-Ok.) proposed a tougher amendment which was defeated in the conference committee.

One of the senator's aides said, "Because the amendment says, '10 or fewer violations,' I think you'll see a lot of inspections where they find 11 violations. Sen. Bartlett will vote against the bill, I think."

### FIFRA approved by Congress

With the passage of the Federal Insecticide, Fungicide and Rodenticide Act by both Congressional houses, the bill is expected to be signed by President Jimmy Carter.

Congressional staffers, who worked on the bill, expect the president's approval because the Environmental Protection Agency worked closely with the drafting of the bill.

"We worked so closely with EPA that it is unlikely there will be any problem," said a spokesman for U.S. Rep. Floyd Fithian (D-Ind.). Fithian drafted amendments to the bill.

An EPA spokesman said, "While we don't agree with everything in the bill, we are not going to ask the president to veto it."

The bill was passed by voice vote in the House on Sept. 19 and in the Senate on Sept. 18.

FIFRA would make states the primary enforcers of the law rather than the EPA. It would make these exceptions in the applications:

- using a pesticide at less than label concentration;
- mixing pesticides with fertilizer not specifically prohibited by the label;
- applying a pesticide for a target pest not listed on the label providing the application is to a labelled crop, animal or site and the label does not specifically prohibit use against that target pest;
- using a method of application not listed on the label.

### DBCP restrictions made permanent

The Environmental Protection Agency has made permanent its temporary restrictions on the pesticide Dibromochloropropane, DBCP, which is used on lawns, golf courses and ornamentals.

DBCP is used against nematodes. The permanent restrictions are subject to a hearing, which must be requested by mid-October. Even if a hearing is requested the temporary restrictions would remain in force.

somes has been marketing a range of rotary mowers manufactured by Wisconsin Marine.

Wisconsin Marine sales have doubled each year since 1975 and projections show a continuing substantial growth for the next five years. To support expansion plans the company recently acquired an option to purchase 40 acres in Johnson Creek, Wis. Construction will begin this year on a 90,000-square-foot manufacturing plant, which will more than double the present facilities.

### SEED

#### Pickseed to market two new ryegrasses

Pickseed West, Inc., Tangent, Ore., has introduced two new turf-type perennial ryegrasses — Fiesta and Blazer — to be available for distributor sales this year.

The two new ryegrasses are characterized by fine texture, low growth, rapid germination, excellent seedling vigor, disease resistance and winter hardiness, the company said.

Fiesta is earlier in maturity and has a medium dark green color, while Blazer is a later variety with a truly dark green appearance.

Both of these ryegrasses perform well in bermudagrass overseeding, in turf mixtures, or in monoculture seeding. They are also available in Pickseed's new turfgrass mixture, Futura.

According to marketing manager Mike Robinson, Fiesta, Blazer and Futura will be distributed by Pickseed West, and also by Otto Pick & Sons Seeds, Ltd., Richmond Hill, Ontario.

### MARKETING

#### Lofts establishes new sod division

Lofts Pedigreed Seed, Inc., Bound Brook, N.J. has established the Lofts Proprietary Turf Division to cater to the special needs of sod growers.

The new division will handle every available proprietary grass seed and blend, regardless of the producer, from its distribution points across the United States.

The new division will be staffed by men and women specially trained in every phase of sod production, with special backing by Lofts director of agronomy Richard Hurley.

# Which aeration hole is better for your greens?

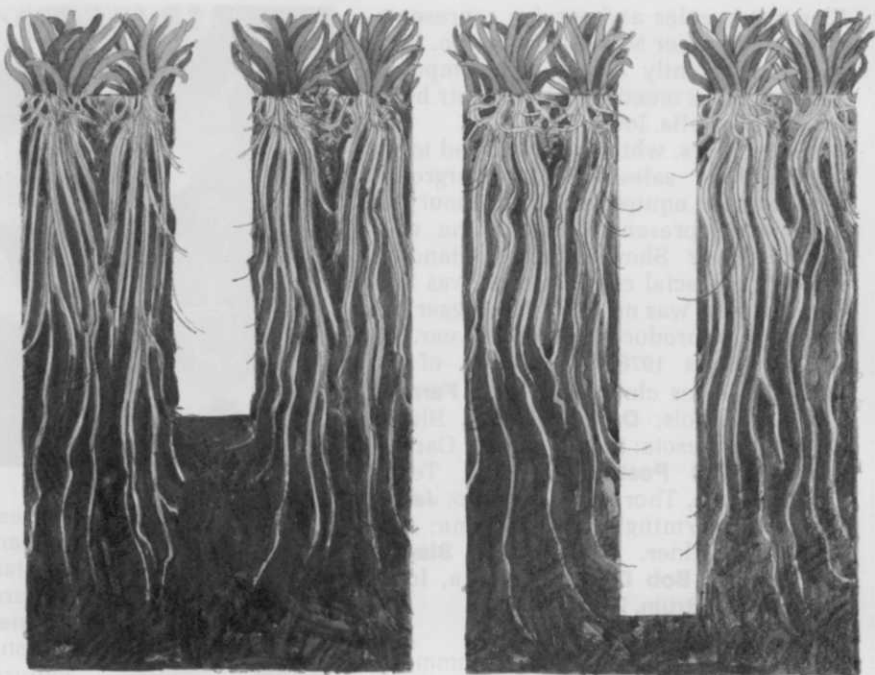
The answer, if you haven't already guessed, is the Greensaire II hole. And for good reasons.

One, it's deeper. The primary objective of aeration is to help air, water and fertilizer penetrate the soil. The Greensaire II removes cores up to 3" deep, allowing these vital nutrients to reach the root zone where they're needed.

The fact that there are 36 of these deep holes per square foot means that you also remove more soil. This not only relieves the toughest compaction problems, but it also allows you to replace more of the old, depleted soil.

The Greensaire II hole is precise. It won't affect the roll of a golf ball, so your green is back in play sooner. You can aerate most greens in 45 minutes or less.

And when you use the Greensaire II, you can also use the unique Ryan Core Processor attachment. It catches the



cores, separates good soil from debris, puts the good soil back on top, and bags the debris. You aerate, top dress and collect thatch in one operation.

If you want these same fine aerating qualities, but on a smaller scale, choose the Greensaire 16. It aerates a 16" swath instead of a 24", uses the same selection of tines

and has a convenient windrow attachment that makes core removal easy.

Of course, like all Ryan equipment, these machines are built to last. So when you aerate, don't just scratch the surface. Get the deep penetration you need with the Greensaire II, Greensaire 16 and Core Processor.

Write for your free Ryan catalog today.



## Ryan Greensaire II. The turfman's timesaver.

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## PEOPLE

Eleven top sales and service representative for Vermeer Manufacturing Co. were honored recently during the company's national sales meeting held at their headquarters in Pella, Iowa.

The honors, which are awarded to the top Vermeer salesmen of underground construction equipment throughout the U.S., were presented during the company's Silver Shovel Awards Banquet. Receiving special consideration was Rich Farrens, who was named "Top Digger", as the top sales producer during the year.

Named as 1978-79 members of the exclusive sales club were: **Rich Farrens**, Eureka, Illinois; **Dave Willinger**, Bloomington, Minnesota; **Dick Caldwell**, Carmel, Indiana; **Bill Poston**, Houston, Texas; **Glenn Nelson**, Thornton, Colorado; **James Wallhall**, Birmingham, Alabama; **Lee Sparks**, Gardner, Kansas; **Don Slagter**, Pella, Iowa; **Bob Dieleman**, Pella, Iowa; and **Larry DeBruin**, Pella, Iowa.



**Sandi Pyle** has been named communications coordinator for OMC-Lincoln, division of Outboard Marine Corp. Her new duties will include Yellow Page advertising, dealer field days, national trade shows and public relations. Ms. Pyle attended the University of Nebraska and is a member of the Lincoln Advertising Club. She has been employed in the OMC-Lincoln advertising department nearly five years.



Pyle

Professor **George L. Good**, NY State College of Agriculture and Life Science at Cornell University, has been awarded the highest honor given by the New York State Nurserymen's Association, the 1978 Hall of Fame Award. The award was presented at the association's summer seminar recently held at the State University of New York Agricultural and Technical College at Farmingdale.

Good was recognized for his conspicuous contributions and meritorious service to the nursery industry through his research, teaching, and extension programs in nursery management and landscape horticulture. He was also cited for his leadership role in the college's ornamental horticulture pesticide certification program and for his contributions to the association's program for professional certification of nurserymen.

**Stephen C. Wiest**, a Cornell University graduate student, and his faculty adviser,



Mills

Professor **Peter L. Steponkus**, have been presented with a national award for their outstanding research in ornamental horticulture. They jointly received the 1978 Kenneth Post Award for superior graduate student research in the field of floriculture, ornamental horticulture and landscape horticulture. The award was presented during the American Society for Horticulture Science in Boston.

Rainbird Sprinkler Manufacturing Corporation has recently created two new positions for its turf market. **Ken Mills** has been promoted to one as Turf Product Development Manager. He will be responsible for all new product development.

**Carlyle "Cozz" Regele** has been promoted to the other as Turf Product Technical Manager. He will handle the publishing of technical materials to support the field sales force and distributors. He will also update and improve existing turf products.



Regele

LESCO Products Division of Lakeshore Equipment & Supply Co. of Elyria, Ohio has appointed **Arthur D. Wick** as Northeast Regional Sales Manager. In addition to his previous responsibilities, Wick's duties will include sales activities in Northeast Ohio, Pennsylvania, New York, Connecticut, Massachusetts, New Jersey, Maine, New Hampshire, Rhode Island and Vermont.

Wick, with Lakeshore since 1970, has been the company's top salesman for the last three years.



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*Snow Thrower* clears a 54" path. Two-stage, PTO driven straight bevel gear box powers a big 18" auger.

Blower is 14" diameter with 4 blades. Spout rotates 190° by hydraulics controlled from inside operator station. Auger housing is 25½" high in front.

*Dozer Blade* is 60" x 18", spring-loaded. Raises/lowers hydraulically, adjusts to 5 positions: straight on, right or left, 15° or 30°. Durable 3/16" steel blade is reversible and replaceable. Clears snow, parking lot debris, loose dirt, etc.

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# SPECIES, SOIL, LOCATION AFFECT TREE FERTILIZATION

By Elton M. Smith, Professor of Horticulture, Ohio State University

Many factors influence how much fertilizer shade trees need, such as species response, soil variation, and location. Recognizing differences in these factors will lead to proper fertilization and to im-

proved performance of the trees.

## Species

Are there differences in the fertilizer requirements between tree species and/or cultivars or can we treat most trees in a similar manner? Hopefully, one fertilizer could be applied on all tree species, at one rate, to simplify the process. Fortunately, this can be done, at least, on a local level with a few exceptions.

Trees showing signs of nutrient deficiency, often the case when the homeowner contacts the arborist, landscape or maintenance firm, do not always respond to a complete N-P-K fertilizer. Little leaf Linden, for example, will exhibit signs of nitrogen deficiency with symptoms resembling triazine (simazine, atrazine) herbicide toxicity. A complete fertilizer containing nitrogen will assist that species in restoring to normal foliage color. However, Oak trees with the typical dark green veins and yellow interveinal areas are usually in need of iron. The exact same foliar symptoms on Maples indicate a lack of manganese. A complete fertilizer, even with minor elements added, would quite likely not correct the problem of Oak and Maple. Therefore, it is important to realize that certain trees, particularly when grown out of their native habitat, may have specific nutritional needs.

## Soils

Soils, as all professionals are aware, vary from sandy loam to clay loam with most soils, in landscape sites, of the silt to clay loam type. Understanding the differences between sand and clay in respect to fertilizer rates and frequency, cation exchange capacity, and pH are important. Recognizing too, that soils in landscape sites are often subsoil or a subsoil mixture, often heavily compacted from construction equipment and typically poorly drained create a whole new set of challenges for the tree care firm.

It's these variations in soil texture that cause industry representatives to "throw the suggested fertilizer guidelines out the window" and begin a new program.

Sandy loam soils with low cation exchange capacity (a measure of the capacity of soil to hold exchangeable cations:  $H^+$ ,  $Ca^{++}$ ,  $Mg^{++}$ , and  $K^+$ ) will need to be fertilized with a low rate of fertilizer but at more frequent intervals.

The pH is a measure of soil acidity or alkalinity and its significance to plant growth is its effect on mineral element availability. A pH of 6.0-7.0 in mineral soils represents that range in which most mineral elements are available to the largest degree. The most ideal pH range for the majority of trees in the north is 6.0-6.5. A very acid soil pH of 4.0 would result in deficiencies of certain elements



**Littleleaf Linden** (*Tilia cordata*) six years after growth in poorly drained silt loam soil. Upper right: Fertilized. Lower left: Unfertilized.

such as N, P, K and Mg and possible toxic levels of Fe, Mn and B. Highly alkaline soils of 9.0 would result in deficiencies of Fe, Mn, Cu, Zn, as well as N. Toxic release of K, S, Ca and Md are possible at such a high pH reading.

Subsoils often have a significantly lower pH than the top soil and industry workers should be alert to these kinds of conditions. Acid soils are likely to have more acid subsoil and alkaline soils, more alkaline subsoil. These variations should be considered when adding limestone or acidifying agents.

Compacted soils arise from equipment during construction or regular foot traffic and these situations are common to the downtown area, new construction sites, parks, college campus grounds, shopping centers and other people concentrated areas. Compacted soils are typically poorly aerated soils, and without an adequate supply of air roots of most trees grow quite poorly. Applying fertilizer via the drill hole method or injection under high pressure are the preferred methods of application in these situations. Fertilizing trees under conditions of adverse site or environmental conditions is one of the keen observation and common sense.

#### Location

The location of a tree in the landscape may influence its fertilizer practices. A shade tree in the backyard, typically without stress conditions, usually will require less fertilizer and few applications than a tree planted between the sidewalk and street. The root zone area of the latter is reduced, likelihood of soil compaction, exposure to highway salts, road dust or dirt and air pollutants is greater. Each of these conditions contribute to the need to give greater attention to tree care practices including regular fertilizing to maintain healthy growth.

#### Determining fertilizer needs

As a guide to proper fertilization, a soil test is recommended prior to fertilizing. If for no other reason, commercial growers test fields prior to planting to make certain that they correct the pH and to incorporate phosphorus if either is needed. It's difficult, if not impossible, to change pH or obtain satisfactory distribution of phosphorus after planting trees. Soil testing may not be necessary for every planting job, however, it should be considered when working in a geographic area where the pH is not known, where site conditions may be unusual or on larger jobs that may involve more than one soil type.

After the planting is completed, testing procedures include both soil and plant analysis. Plant analysis will indicate the precise quantity of 10 or 12 mineral elements in the plants the days of sam-



**Bark splitting**, common with young transplants of Littleleaf Linden, can be markedly reduced by proper fertilization.

pling. Instructions for sampling soils and foliage are available from local County Cooperative Extension Service offices. Private laboratories have testing services available but for the most part do not have individuals trained in Landscape Horticulture that can make accurate recommendations for the differences that exist in the different kinds of woody ornamentals produced in most states.

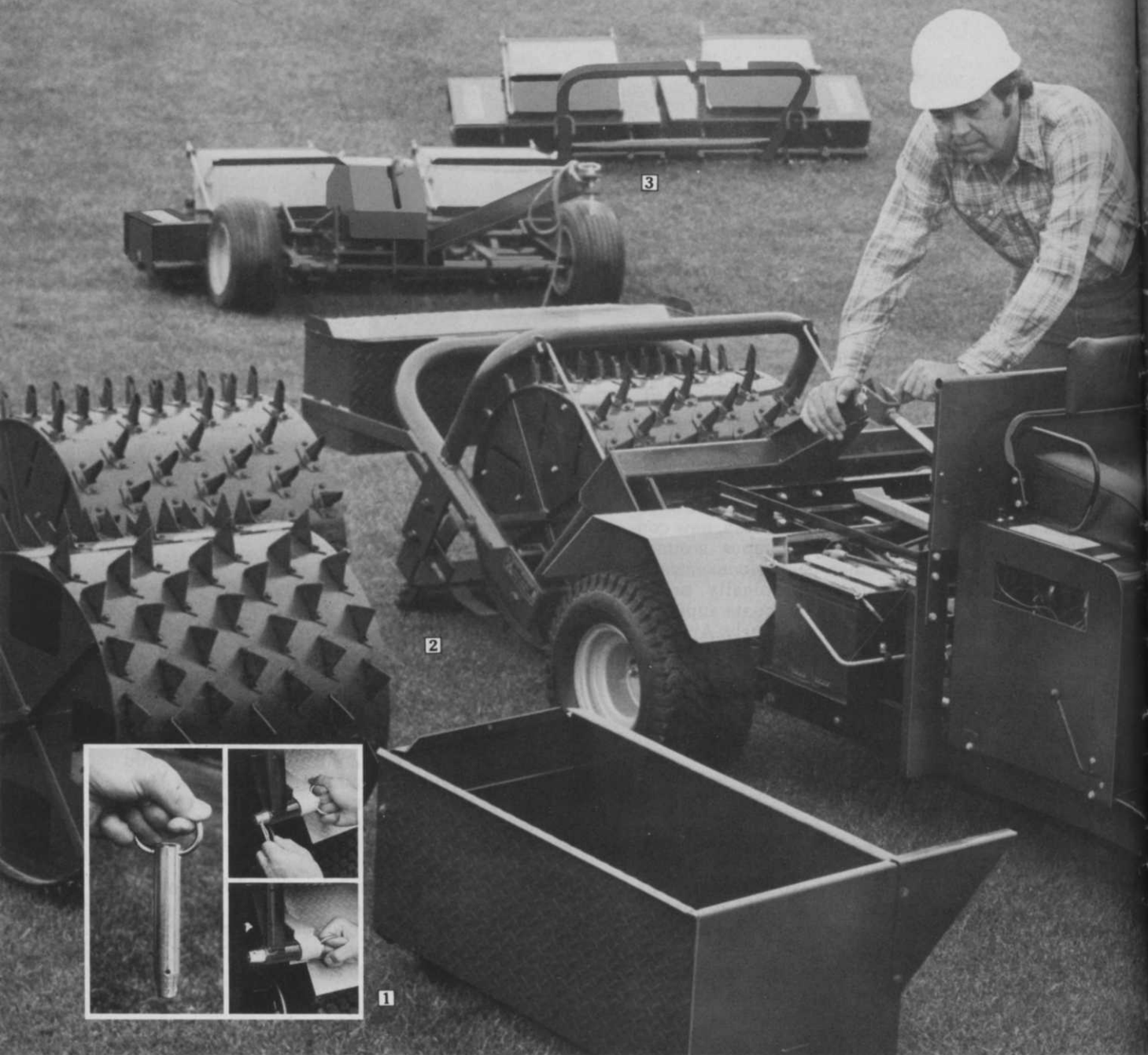
Although plant analysis is utilized far more to diagnose suspected mineral disorders, both plant and soil analysis should be used as an aid to maintaining a proper nutrition program rather than waiting for deficiencies to occur.

#### Rates

The purpose of fertilizing trees the first few years following transplanting is to increase height, width and caliper. However, once the trees are established and growing well the function of fertilizer treatments are basically to maintain satisfactory growth and health but not necessarily to produce optimum height or caliper, such as the commercial nurserymen is seeking.

Research in Ohio has shown that approximately 3 lbs. of actual nitrogen, the mineral element most responsible for vegetative growth, per 1000 sq. ft. or 6 lbs. every other year is all that is needed to maintain the health of shade trees in most landscape situations. If foliage color, annual growth or general vigor is not normal, increase the rate to 5 or 6 lbs. N/1000 sq. ft./yr. If soil or foliar test results are available, by all means follow these recommendations, otherwise the suggested rate above could be used as a guide.

As a general rule, trees respond well to fertilizers with a 3-1-2 or 3-1-1 ratio such as 24-8-16, 18-6-12, 18-5-9, 15-5-5, 12-4-4 or similar formulations. In



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Use this versatile attachment to spray greens, hard-to-reach roughs, fairways, trees, bushes. The polyethylene tank holds up to 100 gallons of chemical solution. The three-way boom provides an accurate spray for proper application and less chemical waste. The Turf-Truckster transmission and variable speed governor assure uniform ground speed. And the optional handgun lets you "fog" an area or spray up to 40' in the air.

\*Rating for vehicle equipped with 9.50-8 rear tires.





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### 8 QUICK AERATOR

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designed to slice greens and aerate fast. It attaches to either Turf-Truckster with just three pull pins. And is hydraulically lifted from the driver's seat for easy movement from green to green. Three tine types are available for varying soil conditions: slicing, coring (two sizes) and open spoon.

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## Tree Fertilization

other words, trees require 3 times as much nitrogen as phosphorus. In many soils the potassium is depleted rather quickly and it should be applied at twice the rate of phosphorus.

The trend in recent years has been to higher and higher analysis in the fertilizer package. Quite often the nitrogen content is 30% or more, and is 4 or 5 times the phosphorus level and these too, although promoted for turf, can be satisfactorily used around trees.

If 3.0 lbs of actual nitrogen is to be used/1000 sq. ft., how much 15-5-5 is needed? To determine the rate of fertilizer, divide the % nitrogen on the fertilizer bag into 3.0. Thus,  $(3.0 \div 0.15 = 20)$  dividing 3.0, the rate of N, by 0.15 (the % of N on the fertilizer bag with two decimal places as a percent of 100) equals 20 lbs. of 15-5-5 needed to apply 3.0 lbs. of actual N/1000 sq. ft.

### Timing fertilizer applications

Greenhouse producers often fertilize their crops with every watering to optimize growth. Commercial nurserymen may fertilize trees 3 or more times/season to obtain the best rate of growth. In the landscape, however, trees are fertilized at much less frequency because optimum growth is not the major objective but, rather maintenance of healthy trees.

Fertilizing once a year is certainly preferable to longer intervals. Although applications twice a year in many situations would be advised. However, many people object to paying for more than an annual fertilization. The best time to fertilize trees is autumn, generally between October and December. The second best time would be early spring prior to growth usually between February and early April. The next choice would be early to mid-summer. If the fertilizer could be split into equal parts and applied in each of 2 or 3 seasons plant response would be superior to one season or alternate year treatment.



**Yellowing of the foliage** of Eastern White Pine (*Pinus strobus*) and other trees can be prevented by early spring trunk implantation of iron containing capsules. In the pine shown above the capsules were implanted in the main trunk just above the lowest limb.

### Methods of fertilizer application

Liquid injection of fertilizer into the soil is rapidly taken in by the roots of trees and is a good method to correct deficiencies of specific mineral elements. Also, the addition of water to dry soil is desirable in the summer.

The major advantage to the drill hole system is opening of heavy compacted soil to provide air. This technique and liquid injection avoid the excess grass growth in turf areas from surface applications.

Surface application is, however, as effective in providing tree response with most species as other methods. It is quick and the least expensive, but should be avoided in quality turf areas.

To correct minor element deficiencies, liquid fertilization to the foliage should be considered, especially for iron deficiency. This method should not be considered adequate as a means of providing all the necessary mineral elements required by plants.

Tree trunk injection and implantation is ideal to apply minor elements such as iron, manganese, zinc, etc. Due to soil pH, moisture relationships and other conditions, this method is often more satisfactory than liquid fertilization of the foliage.

The method selected is dependent on the type of fertilizer being used, the specific purpose of fertilizing, soil conditions, location of the tree, the presence of quality turf, among others. Needless to say, equipment should always be properly calibrated and in good working order.

### Summary

To answer the question of how much fertilizer a shade tree needs, the applicator must consider several factors. We must know species differences to more precisely define specific requirements. Soils are variable from the standpoint of textures, pH, and cation exchange capacity. Recognizing these differences will help us to fertilize more accurately for the performance of the trees. The location of trees in the landscape often dictate differences in fertilizer practices particularly if unusual stress factors are involved from humans, autos, pollution, etc. Fertilizer needs of trees can be identified with soil or plant analysis. Where recommendations are not available, based on laboratory tests, fertilize trees at the rate of 3 lbs. actual N/1000 sq. ft./yr. Use a 3-1-2 or 3-1-1 ratio to provide the necessary phosphorus and potassium. Apply the fertilizer annually or more often, if possible, depending on tree growth. Late autumn is a good season to apply fertilizer with early spring a solid second choice. Several methods can be selected to apply fertilizer and the choice depends on several factors.

Fertilizing shade trees to maintain satisfactory health and vigor requires a number of judgments based on keen observations by experienced people.

WTT