

By HAROLD DAVIDSON
Department of Horticulture
Michigan State University

Are Your Trees Starving to Death?



Iron chlorosis in oaks is associated with alkaline soils containing relatively high concentrations of phosphates and bicarbonate ions.



These maple leaves exhibit signs of chlorosis. The probable cause is a manganese deficiency.



Most chlorosis can be corrected by using Fe or Mn chelates or by inserting iron-containing capsules into the trunks of the trees.

IN MOST CASES, the chances are your trees are not starving to death. But rather they are enjoying a more than adequate diet of N, P and K, since turf people are known to be fairly liberal in applying fertilizer to turf. And where turf is well fertilized, the trees in those areas are also well fertilized.

However, there are a couple of situations where the trees could be starving to death in areas of plenty. This would be where you are irrigating the turf with water of high pH, in the range of 7.5 to 8.5, and where there are tree species — oak, sugar maple, sycamore — that do not like the alkaline environment. In this situation, the trees develop chlorosis; that is, the leaves fail to develop the green color in the area between the veins, although the area adjacent to the veins remains green. The chances are fairly good that the trees are suffering from iron or manganese chlorosis. It is difficult to determine the difference between the two deficiencies without chemical testing. The probability is fairly good that on oaks, especially pin oak, that the problem is related to iron and on maple it could be Mn.

Iron chlorosis is aggravated by factors that promote the oxidation of iron from the ferrous (Fe^{2+}) to the ferric (Fe^{3+}) form. It is associated with alkaline soils containing relatively high concentrations of phosphates and bicarbonate ions. Also, decomposing organic matter in alkaline soil will help to increase the alkalinity of the soil and thus maintain iron in the ferric form.

Plants that cannot counteract the alkaline soil factors will develop iron chlorosis. The fate of the plant is related to its ability to change iron from Fe^{2+} to Fe^{3+} .

Many remedies have been recommended to correct iron chlorosis. They include: 1) the pounding of iron nails into the trunk, 2) injecting iron salts, such as ferric citrate, iron tetracetate and iron sulfate into the trunk, 3) spraying the leaves with various solutions containing iron, 4) application of iron salts to the root zone, 5) the use of iron chelates both as sprays and soil injection, and 6) modifying the soil pH by using various acidifying agents,

(Continued on page 54)



The initial response to the injection will be browning at the sight of application. The turf usually closes in completely in 4 to 8 weeks.

Nematodes (from page 52)

limited, primarily because of the belief that lower temperatures and a shorter growing season limit the opportunity of the nematode colony to build up. Perry has conducted some research that indicated significant nematode problems do occur on greens and fairways in the Midwest.

Vigorous turf provides the best weed control anywhere, and a

healthy turf is within reach of everyone, Horn concluded. Nematode eradication is part of the insurance package.

Trees (from page 20)

such as ammonium sulfate, sulfur, aluminum sulfate or sulfuric acid.

Iron sprays will green up the

foliage with which it makes contact. However, leaves that develop after the treatment are generally yellow. Sprays containing chelates are generally unsightly and therefore not too desirable. Treatments used to change the pH of the soil are slow with the exception of the sulfuric acid treatment which is rather critical and must be applied with caution. The best results have been obtained by the use of soil treatments, particularly with the use of iron chelates. However, these remedies have not been without their disappointments. Presently, the suggested treatment is the use of iron chelates or iron sequestrants adapted for use on alkaline soils. These products should be applied in early spring before or just after growth starts and at concentrations recommended by the manufacturers.

The use of iron-containing capsules inserted into the trunk of chlorotic trees has also shown promise. A number of holes are bored into the trunk of the chlorotic tree, with the aid of a high speed drill. The holes should be deep enough so that

(continued on page 56)

HANNAY REELS KEEP HOSE ON THE JOB



You can handle more hose, handle it faster, easier and with greater safety when you install Hannay reels on your spray equipment. Reel handling will keep your hose in service longer, too. Choose your reels from the widest selection of sizes and rewind options for standard or high pressure service. They're all described in Catalog H-6612-ID. Send for your copy.



HANNAY REELS

CLIFFORD B. HANNAY & SON, INC., WESTERLO, NEW YORK 12193

PRINCETON



Models available in 16", 20", and 24" cutting widths. Our Harvester cuts and palletizes slab sod at a minimum cost and with maximum employee efficiency.

THE LEADER IN CUSTOM-DESIGNED EQUIPMENT FOR THE SOD INDUSTRY

PRINCETON MFG. CO.

2625 Johnstown Road
COLUMBUS, OHIO 43219
Tel. (614) 475-8520

Trees (from page 54)

the capsules when inserted will be situated in the sapwood with the head of the capsules flush with the cambium. This will allow the iron citrate to be dissolved in the sap and translocated to the leaves. Capsules inserted during the early stages of growth have produced positive results in 10 days or less.

Information for the correction of manganese deficiency is not as readily available since Mn deficiency of ornamental trees is not too common. But the use of manganese sprays has been effective in "greening up" the foliage. However, the use of manganese chelates injected into the soil in the spring should produce more lasting results.

Trees in well maintained turf areas are probably not starving to death. But in areas where turf is being irrigated with water that has a high pH, it is possible that certain species of trees may be lacking in iron or manganese. These deficiencies can be corrected by the use of Fe or Mn chelates or by inserting iron-containing capsules into the trunks of trees.

BONDS (from page 16)

In order to satisfy itself that you can perform a surety must inquire into and satisfy itself as to your:

1. **Background and history**
2. **Your organization**
3. **Your equipment or the availability of equipment**
4. **Your business acumen**
5. **The adequacy of your professional, i.e. legal, accounting, etc., advice**
6. **Your cost records and internal accounting system**

Similarly, in reviewing your ability to pay your bills the surety must satisfy itself as to:

1. **Your credit history or how you have paid your bills in the past**
2. **Your available bank credit**
3. **Your corporate or personal finances**

Since your ability to perform, once questioned, is rarely tested on a regular basis the emphasis in the long run rests on your continuing ability to pay your bills and finance new work. The more financial data you furnish a good surety the more confidence you will engender.

For instance, your fiscal finan-

cial reports are going to carry more weight than your interim financial reports. There are a lot of reasons for this but it all boils down to the fact that if you have really made a profit you will have to pay a tax on it. If you are paying taxes you are making money. Now, there are four methods of recognizing income, namely:

- Cash
- Accrual
- Percentage of Completion
- Completed Contract

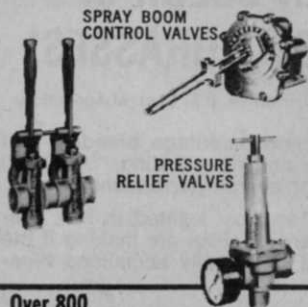
You can be on one method for taxes and another for credit. This is fine. But at the end of your fiscal year the surety can review your reported and unreported profits, determine what tax might be due on your unreported profit and arrive at an honest net worth or working capital for your company. The figure which they arrive at should not be what determines the amount of surety credit you receive but it will help them to determine your ability to pay your bills and finance new work.

Scheduling in a financial statement is almost a prerequisite since

(continued on next page)

SPRAYING SYSTEMS CO.

TeeJet[®] SPRAY NOZZLES AND ACCESSORIES



SPRAY BOOM
CONTROL VALVES

PRESSURE
RELIEF VALVES



LINE and
SUCTION STRAINERS

Vari-Spacing, Split-
Eyelet and Hose
Shank BODIES and
NOZZLES

SPRAY GUNS

Over 800

INTERCHANGEABLE SPRAY TIP TYPES AND CAPACITIES...

tapered edge, even and wide angle flat spray... hollow and full cone... disc type hollow and full cone... and flow regulators. The most complete line for spraying herbicides, insecticides, fungicides, liquid fertilizers and foam solutions. All materials. For complete information write for Catalog 35... and for foam spraying ask for Data Sheets 13602 and 13626.

SPRAYING SYSTEMS CO.

North Ave. at Schmale Rd., Wheaton, Ill. 60187
Telephone: 312 665-5000 / Telex No. 72-8409



PROMPT SHIPMENT FROM STOCK

HI-RANGER[®] for MORE JOBS

Model 4E-35PI Hi-Ranger speeds operators to many overhead jobs... lighting and signal maintenance, power lines, road and street signs, painting and repairs... quickly and more productively. Available as truck, track vehicle, or lift-truck mounted. Exceeds utility requirements, to 69 KV.

- Exclusive one-hand 3D control
- Automatic platform levelling
- 8'10½" max. insulation gap
- Many mounting options
- Fast operating
- 8'6" stowed height (on truck pictured)

SAFER...



HI-RANGER Aerial Towers meet the "American National Standard for Vehicle-Mounted Elevating and Rotating Work Platforms ANSI A92.2-1969," as required by the Williams-Steiger Occupational Safety and Health Act of 1970; Part 1910, Occupational Safety and Health Standards; Section 1910.67; Part 1926, Safety and Health Regulations for Construction; Sections 1926.451 (f), 1926.556, 1926.952 (b), and 1926.955 (e), as applicable.

Write for
"4E Data"

HI-RANGER



MOBILE AERIAL TOWERS, INC.



MOBILE AERIAL TOWERS, INC. • Dept. N • 2314 BOWSER AVE. • FORT WAYNE, IND. 46803