

(The leader's passages are Psalm 96:11-13a)

Maybe one reason the grass is so green and growing so well in June is that it is the month of long summer days. It is the month of the Summer Solstice, the longest day of the year. It usually falls on June 21st. I guess that I am always amazed that what seems to be such an early date in the season marks the time, an exact tick on the clock, when the nights grow longer and the days grow shorter. The Summer Solstice is when the

sun rises and sets farthest north, and much to my surprise it pours down one-fifth more heat on the North Pole than on the Equator! From the 21st of June on through the summer months the sun is moving southward, away from us. It seems reasonable to wonder why our warmest days occur when the sun is moving away, but the key lies in the fact that the earth is slow to warm up after the long and cold winter. There is a lag time here for the same reason that the warmest part of the day is not at

noon, when the sun is the highest, but rather in mid-afternoon. At any rate, I suppose that I will always find it hard to believe that the move toward fall seems to start so soon. Needless to say, it is a subtle start!

My wish for all Wisconsin Golf Course Superintendents, including myself, is that this July and August would be as pleasant and comfortable and green as are this May and June. Let's keep our fingers crossed.

Monroe S. Miller

## Wisconsin Pathology Report *Help For Trees With Interveinal Chlorosis*

By Dr. Gayle L. Worf



One of the common—and treatable—problems affecting trees in Wisconsin's landscape are oaks and maples that appear quite yellow. Seriously affected trees will continue to decline and die. Soil and tree injection treatments with iron, manganese, sulfur and similar materials have helped to correct interveinal chlorosis on many trees in Wisconsin. However, more of them have responded poorly or not at all. Recent research reports of Dr. A. Steven Messenger, Northern Illinois University, offer some insight into the reason for the failures often encountered, as well as providing remedial treatments that expand upon those we've used in the past.

If you're having trouble getting a good response with treatments you've administered to date, I urge



you to read this article and consider giving this new method a chance before you get out the saw.

Messenger's work indicates that the **high soil pH** associated with chlorosis **can cause both excesses and deficiencies** of nutrients in trees! For instance, chlorotic oaks may be especially high in phosphorus, and also potassium and nitrogen, while low in one or more of iron, manganese, copper, and possibly zinc. Chlorotic red maples may be low in manganese, but high in potassium and iron! Consequently, treatments with specific nutrients such as iron or manganese have frequently failed in the midwest.

Dr. Messenger has developed a series of recommendations for treating trees showing interveinal chlorosis that involve the **avoidance** of certain treatments and the **application** of certain soil surface and soil injection treatments. These have been tested with some success in Wisconsin, and are given below. We have added the footnotes and parentheses for clarification.

### Recommended interveinal chlorosis treatment procedures

Avoid the use of:

1. Alkaline hard water (use rain or similar water)
2. Limestone or lime-containing materials
3. Phosphorus and potassium fer-

tilizers

#### 4. Nitrate-containing fertilizers

Apply to soil surface in fall to late winter:

1. Enough sulfuric acid to lower topsoil pH to approximately 6.0: 25-40 liters (6-9 gallons) of 10% sulfuric acid\* per 100 square feet beneath the crown. (This reportedly has not injured turf when applied in dormant condition, but be aware of the possibility.)

Apply to soil surface in early spring:

1. 3 pounds of ammonium sulfate per 100 square feet beneath crown and 12 pounds per 100 square feet beyond the drip line.

Apply in auger holes, 2 inches in diameter and 18 inches deep, spaced 18 inches apart in at least two circles around the tree, one circle at a distance from the tree equal to three times the tree's diameter just above its basal flare, the second circle at twice that distance: enough 10% sulfuric acid to fill the hole to within 4 inches of the surface; and immediately add about one teaspoon of manganese sulfate and one teaspoon of ammonium sulfate.

\*One source of sulfuric acid is battery acid, which reportedly contains 33% sulfuric acid.

(CAUTION: Use eye shield, rubber gloves and apron, and other necessary precautions to avoid personal injury when handling sulfuric acid! Also, when preparing a dilution, add acid to the water, rather than the reverse.)

I've seen dramatic turnaround of trees in Wisconsin that have refused to respond to Mauget or Medicap injections, or sulfur and iron soil treatments. Let's hope it will work for you!