THE EXTENSION LINE

Hole Notes welcomes the addition of Bob Mugaas of the University of Minnesota Extension Service as a regular contributor. As Hennepin County Extension Agent, Mr. Mugaas will compile various articles related to the golf field for our information. Bob is an excellent source for answers to many questions on horticultural problems. He may be reached at 542-1420. Written requests should be sent to:

Bob Mugaas
Minnesota Extension Service-Hennepin County
701 Decauter Ave. N.
Suite 105
Minneapolis, MN 55427

This month's articles cover Trees & Stress, High pH soils & flowers and Black Knot of Prunus.

TREES AND STRESS

by CYNTHIA ASH, Assistant Extension Specialist
Plant Pathology, Minnesota Extension Service

Healthy, established trees can recover from the drought of 1988. However, many trees which previously appeared to be healthy were actually under stress from disease, insect, other environmental factors and/or mechanical damage. These types of stress rob the tree of its stored food supply: starch. When a tree is damaged by any of these factors it uses part of its stored food supply to replace lost leaves or branches or heal wounds.

In the meantime the appearance of the tree remains basically the same. However, at some point the stored food supply becomes used up. When this occurs additional stresses result in dieback and, if severe, the eventual death of the tree. During spring and summer 1989, regardless of the weather conditions, many trees and shrubs are going to be in that "stressed" category and others will be beyond that and die.

Watering is very important. Not only do plants need the water but without water they cannot take up the necessary nutrients from the soil. In soils where nutrients may be deficient, fertilization is important especially on young trees and shrubs. An organic mulch (such as wood chips or shredded bark) placed several feet out from the trunk of the tree will help to keep the soil moist, prevent weed growth, and keep the soil cooler. High soil temperature kills plant roots, preventing water and nutrient uptake even when water is present.

HIGH pH SOILS ARE DETRIMENTAL TO DAFFODILS

by MARY MAQUIRE LERMAN, Coordinator
Horticulture Programs
Minneapolis Park and Recreation Board

In the past several years I have written an article for the April issues of the Minnesota Horticulturist on our daffodil naturalizing project in the Minneapolis parks. The news has always been good. Unfortunately, this past spring we had some disastrous results at several planting sites. Bulbs that were planted the previous fall in what were considered ideal textural soils failed to emerge. After examining the bulbs last spring and taking soil tests, the information was sent to Dr. Gus Hertogh, a narcissus specialist at Raleigh, North Carolina. His response was that although the soil texture was fine, the pH was too high. In research from the Netherlands, he noted that at pH levels above 7.3, daffodil bulbs often did not develop adequate roots. The bulbs that had been examined from the sites had failed to develop any root system.

It was quite a surprise to find that we had soil pH levels ranging from 7.3 to 8.3 in park areas where construction materials or debris were not involved. We then began a policy of testing all sites for pH prior to planting. Last fall twenty sites were tested. Of those, 15 of the sites had pH readings between 7.6 and 8.0. After consulting with Carl Rosen, Extension Soil Scientist at the University of Minnesota, I assembled the following information to assist in soil pH modification for last fall's planting and replanting efforts. Table 1 below shows the number of pounds of elemental sulfur required per 100 square ft. to lower the soil pH change to occur once added to the soil. Iron sulphate and aluminum sulphate will also lower the pH, but they are 6 to 7 times less effective than elemental sulfur on a weight basis. However, aluminum sulphate is not recommended for lowering soil pH as it has been found to have potentially toxic effects such as restricting root growth at lower pH levels. If you want to lower the soil pH faster than with elemental sulfur, iron sulphate would be the recommended choice as the reaction time for the pH change is usually 2-3 weeks.

Using the table for elemental sulfur, multiply the recommended rate by 7 to calculate the correct number of pounds of iron sulfate to apply. for example, if your soil tests out as a pH of 8.0 and is sandy soil, you must apply 7 x 3.0 (or 4.0) to = 21 lbs. of iron sulfate for each 100 square feet of soil area to lower the pH to 6.5.

Once you have lowered the pH levels, you can help maintain the lower pH by applying nitrogen fertilizers that contain ammonium. Ammonium sulfate is the best acidifying nitrogen fertilizer source and should be applied at label recommended rates.

If you live in western Minnesota, your pH problem in clay soils is compounded by higher levels of calcium carbonate. This effectively reduces the choice of plants for your garden to those that can tolerate the higher soil pH levels.

In our daffodil planting efforts last fall, we first augured the planting holes. Then iron sulfate was applied with a broadcast spreader over the area prior to planting the bulbs. In this way the sulfur was mixed into the planting soil when the bulbs were planted. Use personal protection when applying iron sulfate as it is a fine dust. A protective dust mask and safety goggles or glasses is needed, and a disposable protective coverall (such as *Tyvek) is ideal. If you don't wear a coverall, be aware that much of your clothing will have rusty stains after washing. Be sure to wash your clothing separately from your other non-gardening clothing.

*The information is given for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement is implied.

Minnesota Nursery and Landscape Association Newsletter, April, 1989.

BLACK KNOT OF PRUNUS

by CYNTHIA ASH, Assistant Extension Specialist Plant Pathology, Minnesota Extension Service

Black knot is a common fungal disorder of wild and cultivated species of plum and cherry. The characteristic symptom is an elongate woody black gall formed on the sides or encircling branches and occasionally trunks of susceptible hosts. Infected shoots may bend and twist at the site of infection giving the stem a gnarled appearance.

New infections of black knot occur in the spring during wet periods on new growth or at wounds. This infection can occur in as little as 6 hours when the temperature is 21-24 C. Infection continues to occur during the summer but at a much lower level. Infections which occur in the spring may be slightly visible by fall as swollen cracked stems. The infection is put on hold during the winter but continues the next spring with the development of an olive green color to the knot and the release of spores during wet periods. Approximately two years after the initial infection the knots are hard and black in color. If the stem is not killed the knot can become perennial.

Susceptible plants should be inspected in late winter for swollen and galled areas. These should be removed at least four to five inches below any sign of infection and destroyed. Several inspections during the spring will aid in removing any infections which were missed. A dormant application of lime sulphur following late winter pruning will reduce the amount of overwintering inoculum on the plant and further reduce the possibility of spring infection. (Dormant applications are applied after pruning but before bud break. The day temperature should be in the forty degree range and the night temperature should not fall below freezing.) Regular fungicide applications can be used to increase control during the growing season but should be considered as a third line of defense after pruning and lime sulphur application.