be clean with no soil particles, and the container (basket) in which the clippings are caught must be very clean with no fertilizers apparent and they must be properly handled all the way to the laboratory. Likewise, the same advice is applicable for soil tests. The soil test will also be a good means of determining micronutrient deficiency provided you take into account the soil reaction - whether the soil is acidic or alkaline.

There is no question that on sand profiles micronutrients will be limiting if not supplied. For this reason, we have tried to develop a formulated fertilizer that supplies extremely small amounts of micronutrients with each application and can essentially be used every time a putting green or sand-based sports field is fertilized. This fertilizer formulation has proved very successful for practitioners in the Pacific Northwest for approximately 5 years at this point and we feel it is doing a good job on sand root zones with no deficiencies ever having been observed under this program.

In conclusion, we must keep reminding ourselves that there are 16 nutrients that are required for plant growth, three of these being available from air and water, N, P and K from fertilizers, calcium and magnesium are available from liming materials and sulfur is available from any number of sources including elemental sulfur materials. The other 7 considered to be micronutrients must be supplied in very small amounts where required and on a frequency that the plant does not become deficient.

**THE EXTENSION LINE**

Bob Mugaas of the University of Minnesota Extension Service is a regular contributor to Hole Hotes. As Hennepin County Extension Agent, Mr. Mugaas compiles 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 612/542-1420. 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 Perennials, Oak Wilt, and Purple Loosestrife.

**PERENNIALS**

by Don Selinger  
Plant Materials Committee  
Minnesota Nursery and Landscape Association

Perennials that provide us with color throughout the better part of the summer have been gaining rapidly in popularity. In many respects they combine the flowering attributes of annuals with the benefit of not having to replant each year. This is especially true of those that are reliably hardy, relatively maintenance free and will tolerate or thrive under the hot, dry conditions we have been ex-
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periencing the last few years.

MOONBEAM COREOPSIS (C. verticillata 'Moonbeam'),
PURPLE CONEFLOWER (Echinacea purpurea 'Bright
Star') and BLACK EYED SUSAN (Rudbeckia fulgida
'Goldsturm') are three that have been gaining in
popularity because they do satisfy the criteria mentioned.
They can provide a bold display of color by planting them
in mass or they are attractive enough to use as individual
specimens.

COREOPSIS MOONBEAM forms a very attractive clump
with finely textured foliage that is covered in summer with
creamy yellow daisy-like flowers. Various cultivars of
Coreopsis (Tickseed) have long been used in the perennial
garden to provide summer color and as a good
source of cut flowers. Most of the cultivars of Coreopsis
used as a cut flower possess a deeper golden yellow and
have their blooms borne on stems of 18 to 24 inches that
are ideal for cutting. While the other cultivars are superior
as a cut flower, Moonbeam is unsurpassed for use as a
landscape plant. Besides having a paler yellow flower,
Moonbeam forms a more compact plant of up to 18
inches with almost fern-like foliage that lends itself to
landscape use and makes an attractive plant whether it is
in or out of flower. Moonbeam will do well in sun or light
shade and in any well drained soil. It is relatively insect
and disease free and will tolerate the heat and drought
quite well.

PURPLE CONEFLOWER is a member of the sunflower
family that is native to much of the eastern United States
including Minnesota. Several cultivars are available, with
Bright Star being the more common one. Bright Star
produces an abundance of blooms of deep rosy-purple
with a maroon cone-like center that remains attractive
even after the flower fades. The flowers are produced on
plants of 2 1/2' to 3' from midsummer until frost. In addi-
tion to making an attractive landscape plant it can also be
used as a cut flower, either fresh or dried. Being a native
of prairie conditions Purple Coneflower will withstand
heat and drought extremely well and does not have any
serious insect or disease problems. It does require full
sun and will do well in most any well-drained soil.

BLACK EYED SUSAN (Rudbeckia) is a very common
native of the prairie in a good part of the United States.
The cultivar Goldsturm was selected for the deep yellow
flowers, up to 3 to 4 inches in diameter, that are set off by
a deep bronze black cone in the center. The flowers,
which are also good for cutting, are produced freely
during August and September on an attractive plant of 2
to 2-1/2 feet. It will also withstand the heat and dry con-
ditions that are common to the prairie and does best in
full sun to light shade. Insects and diseases are generally
not a problem.
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OAK WILT

The Minnesota Department of Agriculture has recently published two excellent publications relating to Oak Wilt control and prevention: "Oak Wilt Control and Prevention on Construction Sites" and "Root Graft Barriers for Oak Wilt Control."

Both of these articles are available at no cost by contacting: Minnesota Department of Agriculture, Oak Wilt Control Program, Plant Industry Division, 90 West Plato Blvd., St. Paul, MN 55107; Telephone: (612) 296-3349.

The following summary and flow chart are adapted from the fact sheet "Oak Wilt Control and Prevention on Construction Sites."

SUMMARY

Oak Wilt is the most serious shade tree disease in Minnesota. A Department of Natural Resources (DNR) survey of oak wilt shows the nearly all infections are associated with construction. If your development sites are currently free of oak wilt, prevention is easy and involves only minor modifications in construction practices. Once oak wilt is established in an area, control is necessary. Obviously, there are costs involved with this work. But the alternative costs of doing nothing (decline in property...
value, tree removal, skeptical buyers, potential liability problems, etc.) may be far more expensive.

The Departments of Agriculture and Natural Resources can help you determine whether oak wilt exists on your development sites. An aerial inventory of oak wilt in 45 townships north of the Twin Cities (the area hardest hit by oak wilt) was completed last year. Computer generated maps of oak wilt infections in this area (down to map size of 40 acres) are available (May, 1989). For these maps or other information on oak wilt and its control, please contact the MDA or the DNR.

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This summer we have received a number of calls relating to the status and control of Purple Loosestrife (Lythrum salicaria). The following information is adapted from literature prepared by the Department of Natural Resources' Purple Loosestrife Program. In addition, they have published an excellent color brochure to aid in the identification of purple loosestrife. There is also color pictures of loosestrife look-alikes so that accurate identification can be made. The brochure can be obtained by writing to:

Minnesota Department of Natural Resources
Purple Loosestrife Program
Ecological Services Section
Division of Fish and Wildlife
Box 25
500 Lafayette Road
St. Paul, MN 55155

or contacting your regional DNR office:

MN Dept. of Natural Resources
2115 Birchmont Beach Road NE
Bemidji, MN 56601

MN Dept. of Natural Resources
Box 756
Highway 15 South
New Ulm, MN 56073

MN Dept. of Natural Resources
P.O. Box 6247
Rochester, MN 55903

There are three species of loosestrife, or LYTHRUM, of interest to horticulturists: Purple Loosestrife, (Lythrum salicaria) and wand lythrum (Lythrum virgatum) are of European origin; winged loosestrife (Lythrum alatum) is native to Minnesota but is relatively uncommon. It is typically found in undisturbed marshes, meadows and prairies.

Growers have grown and sold both European species (L. salicaria and L. virgatum) and many hybrids and cultivars throughout North America. Garden Lythrums in North America have parentage of one, two, or in some cases all three Lythrum species. Some hybrids and cultivars of L. virgatum do produce seed. According to taxonomists, identification of Lythrum hybrids and cultivars is very difficult if not impossible.

The widespread distribution of escaped or naturalized Lythrum has produced some startling examples of nature out of balance. Purple loosestrife is a phenomenally prolific exotic when not kept in check by its natural European predators. In Minnesota, it has spread to over 800 sites, blocking drainage ditches, clogging marshes, and degrading habitat used by waterfowl, songbirds, fur-bearers and other animals and plants. Over 20,000 acres of wetlands are now covered with loosestrife.

In 1987, the species Lythrum salicaria was designated a noxious weed by the commissioner of agriculture. The
noxious weed law and 1987 legislation prohibit the sale and transport of Lythrum salicaria (purple loosestrife) in Minnesota.

In November of 1988, Commissioner of Agriculture Jim Nichols deemed purple loosestrife (Latin names Lythrum salicaria and Lythrum virgatum and any combination thereof) to be a noxious weed as defined in Minnesota Statutes 1987, section 18.171, subdivision 5. This new order supercedes the 1987 commissioner’s order; therefore, the sale of ALL these plants is now prohibited.

Illegal Lythrum plants have many horticultural names:

Plants of L. virgatum parentage:
Rose Queen
The Rocket
Morden Pink
Morden Rose
Dropmore Purple
Columbia Pink

Plants of L. salicaria parentage:
The Beacon
Fire Candle
Bightness
Lady Sackville
Mr. Robert, Robert’s Roseum Superbum
Happy
Atropurpureum var. Tomentosum
Purple Spire

According to Minnesota Statutes, 1975, it is the duty of the occupant of privately owned land (or, if unoccupied, the owner) or the person in charge of public land to control or destroy noxious weeds to prevent their spread.


[86.78] Control of Purple Loosestrife:
Subdivision 1. Definition: For the purpose of this section, “purple loosestrife” means Lythrum salicaria.

Subdivision 2. Establishment of Control Program: The commissioner of natural resources shall coordinate a control program to curb the growth of purple loosestrife. The commissioners of agriculture and transportation must aid and cooperate with the commissioner of natural resources to establish, implement and enforce the control program.

[Purple Loosestrife]

$50,000 is appropriate from the general fund to the commissioner of agriculture, to be available until June 30, 1989, for the eradication of purple

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loosestrife (Lythrum salicaria) on farm land where the farmer is required to eradicate the purple loosestrife because of the noxious weed law.

[18.191] Destruction of Noxious Weeds

This section now provides that effective July 1, 1989, an owner of non-federal lands underlying public waters or wetlands is not required to control purple loosestrife below the ordinary high water level of the water or wetland. The commissioner of natural resources is responsible for the control on public waters and wetlands unless they are owned or managed by the federal government. This section also provides that DNR employees or those under contract with the DNR may cross private land to get to public waters or wetlands to control the purple loosestrife. Landowners may assume responsibility for controlling loosestrife on their protected waters if they notify the DNR in writing.

OFF THE TOP
OF MY HEAD

GREG HUBBARD, CGCS
Editorial Chairman

In an earlier issue, I suggested that we all take some time off during the busy golf season to relieve work related stress and to re-acquaint ourselves with our families. For once, I finally took some of my own advice and took a little visit to the PGA Championship held this last August at Kemper Lakes near Chicago. By showing my GCSAA membership card, my wife and I were each given complimentary passes for each day of play which also included special tent privileges for food and refreshments. As evidenced by the TV telecast, we were treated to an outstanding golf course in superb condition and, of course, were eyeball to eyeball with the best golfers in the world. A thrilling finish topped off a very enjoyable visit and I returned to work a much happier soldier with my batteries fully recharged.

Besides the actual tournament, I was struck by the enor-