



PRO HORT



**Center for Urban Horticulture
University of Washington**

Vol. 6, No. 1

**Cooperative Extension
Washington State University**

Winter 1988

LANDSCAPE MAINTENANCE SEMINARS

**. . . for the landscape
professional**

Cooperating: Center for Urban Horticulture, University of Washington; Cooperative Extension Service, Washington State University; Edmonds Community College; South Seattle Community College.

Designer Athletic Fields

Date : Thursday, January 14
Time : 9 a.m. to 12 noon
Location : Center for Urban Horticulture
Instructor : Mike Hebrard

Discover shortcuts for laying out and maintaining athletic fields—both baseball and football. Seeding, mowing patterns, and equipment are just a few of the topics to be covered. Emphasis will be on labor-saving and material-saving techniques.

Mike Hebrard is athletic field specialist with Hobbs and Hopkins Pro Time of Portland. He has worked at all levels of athletic field management. Mr. Hebrard conducts frequent workshops on athletic field management for landscape professionals, and he addressed the 1986 Northwest Turfgrass Association Conference in Pasco.

PRO HORT Editorial Staff:
Dr. John A. Wott
George J. Pinyuh
Van M. Bobbitt, editor

Managing the Root Environment for Optimum Plant Growth

Date : Thursday, February 25
Time : 9 a.m. to 12 noon
Location : Center for Urban Horticulture
Instructor : Dr. James L. Green

Many, if not most, plant problems originate below the soil line, so it is essential that professional horticulturists understand how roots grow and function. Learn how to manage physical, chemical, and biological factors in the soil for healthy root growth.

Dr. Green is an extension horticulturist, specializing in nursery and greenhouse crops, at Oregon State University. He is also editor of the *Ornamentals Northwest* newsletter.

Viral Diseases of Plants

Date : Wednesday, March 23
Time : 9 a.m. to 12 noon
Location : Center for Urban Horticulture
Instructor : Dr. Paul Monette

Viruses can dwarf, seriously weaken, and sometimes kill plants. Learn what viruses are, how they are spread, and how to recognize their symptoms. Also find out what you can do to control viral diseases and minimize their damage to valuable landscape plants.

Dr. Monette is with the Saanichton Research and Plant Quarantine Station, Agriculture—Canada, in Sidney, B.C. He was a featured speaker at the 1987 Ornamentals Northwest Seminars in Portland.

This seminar qualifies for 3 hours of W.S.D.A. pesticide license recertification credit.

OTHER EDUCATIONAL RESOURCES

Plant Disease Seminar in Bellingham. Dr. Ralph Byther, Washington State University plant pathologist, will present "Landscape Plant Diseases" on Saturday, February 27, 9 a.m. to 12 noon, at Bellingham Vocational Technical Institute. This seminar qualifies for 3 hours of W.S.D.A. pesticide license recertification credit. Registration is \$12.50 before February 20 and \$15 after. For details, call Van Bobbitt, Center for Urban Horticulture, 545-8033.

3rd Annual Women in Horticulture Conference. On Saturday, February 6, a full-day conference at Southcenter's Doubletree Plaza Hotel will address the special concerns of women in horticulture. Keynote speakers are Jean Withers, business advisor, and Jolene Unsoeld, Washington State Representative. In addition, smaller group presentations will cover business practices, marketing, and the hidden job market. The registration fee of \$40 (\$45 after January 22) includes breakfast, lunch, and coffee breaks. For more information, call Jean Canfield, 943-7732, or Jan Rodda, 243-6063.

Edmonds Community College Horticulture Courses—Winter 1988. Evening Courses: Sprinkler Design, Grafting, Computers in Landscape Management, Landscape Business, Winter Plant I.D. Daytime Courses: Soils, Winter Plant I.D., Ferns, Drip Irrigation, Pruning, Rock Plants, Rhododendrons, Plant Propagation, Pesticide Laws and Safety, Landscape Design. 771-1679.

South Seattle Community College Horticulture Courses—Winter 1988.

Evening Courses and Workshops: Plant Diseases, Drainage and Irrigation Systems, Small Engine Repair, Landscape Design, Annuals and Perennials, Native Plants in the Landscape, Year-Round Cut Flower Gardening. Daytime Courses: Pruning, Winter Plant I.D., Nursery Operations, Plant Propagation. 764-5336.

ARTICLES

Cold Hardiness of Plant Roots

Dr. Rita L. Hummel
Washington State University-Puyallup

Nursery production in containers has a number of advantages over field production including such factors as portability and availability of plants for year-round shipping and transplanting, producing more plants in a given area, shortening the production cycle, and increasing the mechanization of nursery operations. The potential for cold damage to root systems overwintered above ground is a major disadvantage of container production. The practice of "instant landscaping" with above-ground containers in urban landscapes also exposes the root systems of large, valuable trees to winter injury.

Plant roots are inherently less cold hardy than the aerial portions of the plant. After 5 weeks exposure to 40°F (4°C), researchers at Cornell University found that *Pyracantha coccinea* 'Lalandei' stems and leaves cold acclimated to -15°F (-26°C), mature roots to 1°F (-17°C), but young roots were killed at 23°F (-5°C). This cold hardiness difference of nearly 40 degrees Fahrenheit indicates the importance of winter protection for above-ground root systems. Susceptibility of root systems to low temperature varies according to species with damaging temperatures ranging from 27°F (-3°C) in tender plants to -9°F (-23°C) in hardier plants. Temperatures which injure or kill root systems have been reported for a number of ornamental plant species. Table 1 lists the relative root hardiness of several commonly grown plants and is reprinted from "Principles, practices, and comparative costs of overwintering container-grown plants." Southern Coop. Series Bull. 313, May 1986, D. J. Beattie, Ed. (Send requests to: Pennsylvania Ag. Expt. Stn., 229 Ag. Admin. Bldg., University Park, PA 16802.)

Table 1. Average root killing temperatures (°F) of selected woody landscape plants.

Taxon	Studer ^a		Havis ^b
	Immature	Mature	All
<i>Magnolia x soulangiana</i> ^c			23
<i>Buxus sempervirens</i>	27		15
<i>Cotoneaster microphyllus</i>	25	9	
<i>Ilex cornuta</i> 'Dazzler'	25	18	
<i>Pyracantha coccinea</i> 'Lalandei'	25	18	18
<i>Mahonia bealei</i>	25	12	
<i>Cotoneaster dammeri</i>	23		
<i>Euonymus fortunei</i> var. <i>vegeta</i>	23	12	
<i>Hypericum</i> spp.	23	18	
<i>Ilex crenata</i> 'Helleri'	23		
<i>Ilex</i> 'Nellie Stevens'	23	14	
<i>Ilex x meserveae</i> 'Blue Boy'	23	9	
<i>Ilex opaca</i>	23	9	20
<i>Cornus florida</i>	21	11	20
<i>Euonymus kiautschovica</i>	21	16	
<i>Ilex</i> 'San Jose'	21	18	
<i>Magnolia stellata</i>	21	9	23
<i>Daphne cneorum</i>			20
<i>Ilex crenata</i> 'Convexa'			20
<i>Ilex crenata</i> 'Hetzii'			20
<i>Ilex crenata</i> 'Stokesii'			20
<i>Leucothoe fontanesiana</i>	19		5
<i>Rhododendron prunifolium</i>	19		
<i>Viburnum plicatum</i> var. <i>tomentosum</i>	19	7	
<i>Rhododendron</i> 'Hino Crimson'	19		
<i>Cotoneaster dammeri</i> 'Skogsholmen'	19		
<i>Euonymus alata</i> 'Compacta'	19	7	
<i>Cryptomeria japonica</i>			16
<i>Stephanandra incisa</i> 'Crispa'	18	0	
<i>Rhododendron</i> (Exbury Hybrid)	18		
<i>Taxus x media</i> 'Hicksii'	18	-4	
<i>Koelreuteria paniculata</i>	16	-4	
<i>Kalmia latifolia</i>	16		
<i>Pieris japonica</i>	16		10
<i>Rhododendron</i> 'Purple Gem'	16		
<i>Rhododendron schlippenbachii</i>	16		
<i>Cotoneaster horizontalis</i>			15
<i>Juniperus conferta</i>	12	-10	
<i>Juniperus horizontalis</i> 'Plumosa'	12	-4	
<i>Juniperus squamata</i> 'Meyeri'	12		
<i>Viburnum carlesii</i>			15
<i>Cytisus x praecox</i>			15
<i>Ilex glabra</i>			15
<i>Euonymus fortunei</i> 'Carrierei'			15
<i>Euonymus fortunei</i> 'Argenteo-marginata'			15
<i>Hedera helix</i> 'Baltica'			15
<i>Pachysandra terminalis</i>			15
<i>Vinca minor</i>			15
<i>Pieris japonica</i> 'Compacta'			15
<i>Acer palmatum</i> 'Atropurpureum'			14
<i>Cotoneaster adpressus</i> var. <i>praecox</i>			10
<i>Taxus media</i> 'Nigra'			10
<i>Rhododendron</i> 'Gibraltar'			10
<i>Rhododendron</i> 'Hinodegiri'			10
<i>Pieris floribunda</i>			5
<i>Euonymus fortunei</i> 'Colorata'			5
<i>Juniperus horizontalis</i>			0
<i>Juniperus horizontalis</i> 'Douglasii'			0
<i>Rhododendron carolinianum</i>			0

<i>Rhododendron catawbiense</i>	0
<i>Rhododendron</i> (P.J.M. Hybrids)	-10
<i>Potentilla fruticosa</i>	-10
<i>Picea glauca</i>	-10
<i>Picea omorika</i>	-10

^a Studer, E. J. et al. 1978.

^b Havis, J. R. 1976.

^c Differences in root killing temperatures for the same taxa were most likely due to variations in root maturity and experimental procedure.



Growing Trees in Parking Lots: Soil and Water Problems

Christina Pfeiffer
Center for Urban Horticulture
University of Washington

We commonly landscape parking lots in hopes of masking their extensive pavement with masses of lush vegetation. Unfortunately, these plantings, like so many urban landscapes, often fail to grow and only add to the visual blight they were intended to correct.

A recent study examined the horticultural problems of parking lot landscapes of four Metro Park and Ride lots in the Seattle area. Design, installation practices, plant selection, site use patterns, and maintenance requirements were investigated in plantings four to eight years old. While many factors throughout each stage of development contributed to poor growth, adverse soil conditions were a major problem.

The parking lot soils were highly compacted. Construction specifications required that the pavement subgrade be compacted to a density of 95%. This left less than 5% pore space, and the vigor of most plants declines when the soil pore space falls below 30%. The compaction contributed to high plant losses where grading

overlapped into landscape beds.

Importing topsoil to these sites did not necessarily improve matters. When "island" planters were cut out of the asphalt and filled with topsoil, the subsoil was so highly compacted that a container situation was created with limited rooting area. Because of the limited rooting area, trees growing in "island" planters had high irrigation and fertilization requirements.

Where six inches of topsoil were placed over the existing subgrade, an interface was created between two distinct soil types. Since water resists movement across such an interface, this practice resulted in shallow planting soils which were poorly drained in the winter and droughty in the summer.

Drought stress was another key problem in these parking lots. In sites without summer irrigation, autumn coloration and defoliation occurred by August. Trees in island planters displayed drought symptoms earlier than trees in perimeter beds. Damaged irrigation systems often interrupted water availability. In addition, irrigation was only installed as a temporary requirement in many of these sites.

The success of parking lot landscapes, and most other urban plantings, could be improved through the following soil management practices:

1) Test soil aeration using bulk density measurements. As a guideline, the density should be no greater than 1.3 grams/cubic centimeter (fine soils) to 1.4 grams/cubic centimeter (course soils).

2) Use larger planting beds or berms to increase the effective rooting area.

3) Till imported topsoils into the existing subsoil. This will create a gradual transition layer instead of a distinct soil interface.

4) Design permanent irrigation systems into all plantings. Restricted rooting areas, reflected heat, and this region's dry summers create extreme drought stress in parking lot landscapes.

Registration Form: Landscape Maintenance Seminars

___ Complete Series: Athletic Fields, Roots, Viruses	\$30.00
___ Designer Athletic Fields	\$12.50
___ Roots	\$12.50
___ Viral Diseases	\$12.50
TOTAL: \$ _____	

Group Rates:

Firms/institutions sending two or more employees per seminar. The rates are:

2-5 employees. . . . \$10.00/person 6 or more employees. . . . \$ 9.00/person

To qualify for group rates: (1) firm's registration must be received at least one week in advance; (2) all registrants must be from the same firm; and (3) total registration fee must be paid with one check or purchase order.

Firms using purchase orders must make prior registration arrangements.

Make checks payable to the University of Washington; no bank cards.

Portion of fees may be used for refreshments and hosting speakers.

Receipts will not be returned by mail; they will be available at the door.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE (DAY) _____ PHONE (EVE) _____

Mail payment and registration to: Urban Horticulture Program, University of Washington, GF-15, Seattle, WA 98195

For more information please call 545-8033.

The Tree Place

Timothy Hohn
Center for Urban Horticulture
University of Washington

This is the first in a series of articles that will describe horticulturally interesting plants. The taxa chosen will be drawn from the collections of the Center for Urban Horticulture, primarily at the Washington Park Arboretum. Before delving into an exploration of these diverse and interesting collections, a review of the purpose of the Arboretum and its plant collections and how they serve the public is in order.

The name "arboretum" comes from the Latin *arbor*, meaning tree, and *etum*, a suffix which designates the place of a thing, thus together meaning "the tree place" or "where the trees grow." However, this definition does not begin to tell the whole story. An arboretum shares many traits common to other institutions but can only be categorized as a museum. In its simplest terms, an arboretum can be defined as: a living museum of woody plants for the purpose of display, education, research, and conservation.

The plant collections at the Washington Park Arboretum and Center for Urban Horticulture are relevant to the professional horticulturist in all four areas of purpose. The entire collection is on permanent display for casual inspection and comparison. Passive education is made possible by comprehensive labelling of the collections, the availability of interpretive brochures, and prearranged access to plant records. More organized and comprehensive educational opportunities based on the collections are available through educational programs offered at the Arboretum and the Center. The collections, by their very existence, serve to conserve taxa which might otherwise be unavailable in the region for access by interested horticulturists and the general public.

Furthermore, plant taxa are better conserved if they are broadly distributed, therefore, it is possible for individuals, commercial concerns, and public horticulture institutions to obtain propagules from the collections by request through the curator's office or the Index Seminum. The deliberate search for and acquisition of plants for culture and evaluation in a region where they were heretofore unknown is a useful form of research, provided the information

is made available to those who wish to use it. Future articles in this publication will attempt to do that.

I look forward to improving our collections programming in support of the goals and purposes of the Arboretum and Center for Urban Horticulture so that the collections are more accessible and of better use to our constituency. Write, or give me a call, and let me know what you think.



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