

Nursery News

TAKE PRIDE IN YOUR PROFESSION—BECOME A CERTIFIED PROFESSIONAL HORTICULTURIST

DECIDUOUS WEEPING TREES

VOLUME 62, NUMBER
2

Some people consider weeping trees beautiful, while others consider them weird. In the past no Victorian Villa was complete without a weeping tree or two. After a long time when weeping trees were found only in arboretums, weeping trees are being used again as today's homes are becoming more romantic and picturesque. Part of the renaissance of interest in weeping trees has been fueled by the growth in popularity of the Japanese style of architecture with its emphasis on form, texture, and individuality. Some weeping trees, like the Weeping Willow and the Japanese Higan Cherry have always been quite common.

In this article I will discuss weeping trees in general and list several of the deciduous weeping trees of note. In the next article for the Nursery News, I will discuss weeping evergreen trees.

Weeping Trees are often cultivars of normally strong growers that have wood so weak that it requires support. Often, weeping trees are propagated with great difficulty. Many are only true to type if they are vegetatively propagated as rooted cuttings or grafted specimens. When propagated by seed there is often a great amount of variation.

Sometimes a normally prostrate or weeping form of a specimen is grafted on a straight trunk to form a weeping standard. As a result, weeping trees usually fetch premium prices.

Weeping trees must be used with some discretion in the landscape. Most weeping trees require a fair amount of room and care must be used in weeping trees placing. Weeping trees call attention to themselves, acting as a focal point in the landscape. Avoid placing them in front of small houses as they then compete too strongly for attention.

(Continued on page 2)



Inside this issue:

Deciduous Weeping Trees	1
Software: Horticopia Trees, Shrubs &	1
Substrate Selection	4
The Water in Nutrient	5
Water Quality in the Greenhouse	8
Pesticides for Controlling Insects and Mites in Interior	9
The Home and Garden Information Center	11
Honey Locust Pest	11
Did You Know	12
Nursery and Greenhouse Nutrient Management Summer	13
Announcements	14

SOFTWARE: Horticopia Trees, Shrubs and

This article will review a horticultural software title which should be of interest to people in the business and students who work with woody plants. The software allows searches for plant material based on criteria that you determine, provides information about the plants selected, shows pictures of the plants in the database, allows you to print the pictures and information in several

(Continued on page 6)

DECIDUOUS WEEPING TREES

(Continued from page 1)

Weeping trees are most at home in an informal landscape, but can be used to soften and naturalize formal landscape designs. In either case, weeping trees are best used one at a time and are best placed off center in the landscape.

Weeping trees can be used quite dramatically at the edge of a pool or stream. Some weeping trees fit very well into rock gardens or flower borders. Because they are often smaller and slower growing than their normal counterparts, many weeping trees can be used to great advantage in patios. The shape of many weeping trees, especially the deciduous ones, is often best appreciated in winter, when the bare branches present a tracery of twigs. Another way of displaying weeping trees is to espalier them on walls or fences where their pendulous branches can display a waterfall of foliage, flowers, and often fruit as the seasons progress.

Even if the propagation of species and cultivars of weeping trees is mostly vegetative, the nomenclature is often confusing, with several common names, and less frequently different specific epithets or cultivars being attributed to the same plant. Two cultivar names occur most frequently when weeping trees are named. These are 'Pendula', meaning pendulous and 'Tristis', meaning sad.

Acer palmatum

Japanese Maple

Zone 5

Most reach height of 4 feet and spread of 6 feet

Many pendulous cultivars

Laceleaf forms are aristocrats of weeping trees

Can not tolerate extreme heat and cold

Betula pendula 'Tristis'

Weeping European Birch

Zone 2

Taller than 'Youngii' at maturity

Narrower form than 'Youngii' with more rounded head and drooping wavy branches

Betula pendula 'Youngii'

Weeping European Birch

Zone 2

15 feet tall at maturity

One of most attractive weeping trees.

Pendulous branches give tree gnarled, twisted, and extremely drooping appearance

Handsome at all seasons

Often grafted to high stem to accentuate waterfall effect

Cargana arborescens 'Pendula'

Weeping Siberian Pea Shrub

Zone 2

6 feet tall by 3 to 4 foot spread, but may reach 15 feet tall

Often grafted on high trunk of common pea shrub

Graceful but stiffly pendulous

Thrives on hot summers and cold winters

Cultivar 'Walker' also available – has narrower, strap-like leaves

Carpinus betulus 'Pendula'

Weeping European Hornbeam

Zone 5

Often grafted on tall stem of *Carpinus* or *Ostrya*

Small, but very neat clean tree

Cornus florida 'Pendula'

Weeping Flowering Dogwood

Zone 5

Very stiff pendulous branches – almost prostrate form

Bracts face downward, making it ideal for viewing flowers from below

Sometimes grafted on high stem of species to make interesting patio tree

Fine fall foliage color and glossy red berries

Fagus sylvatica 'Pendula'

Weeping European Beech

Zone 4

50 to 60 feet tall at maturity

Considered the queen of weeping trees - always graceful

Very slow starter – grows faster once canopy shades roots

Green-leaved form

Has central leader

Fagus sylvatica 'Purple

Fountain'

Chance seedling of *P. sylvatica* 'Purpurea Pendula'

Purple-bronze foliage

Grows to 25 feet tall

Very narrow form- branches weep down from central stem

Fagus sylvatica 'Purpurea Pendula'

Purple-leaved Weeping European Beech

Lacks central leader – slow-growing mushroom or dome shape

Rarely more than 8 feet tall

Fraxinus excelsior 'Pendula'

Weeping European Ash

Zone 3

Rather contorted and strictly weeping tree

Retains foliage longer than species in fall

Magnificent against masonry wall

Ginkgo biloba var. *pendula*

Weeping Ginkgo

Zone 4

Rare in this country

Large spreading crown with gracefully hanging branchlets

Tolerates pollution well

Malus bacata var. *gracilis*

Weeping Siberian Crab Apple

Zone 2

30 feet tall

Wide flattened head with drooping branches

Malus 'Louisa'

Hybrid Crabapple

Zone 4

15 feet tall

Scab-resistant dark green foliage

Probably best of weeping crab apples

Very pendulous habit

Malus 'Oekoomezat Echtermeyer'

Hybrid Crabapple

Zone 4

24 feet tall

Purplish red flowers

Reddish purple, 1-inch-diameter fruit

Bronze-green foliage

Semiweeping

Malus 'Red Jade'

Hybrid Crabapple

(Continued on page 3)

(Continued from page 2)

Zone 4

20 feet tall

Each branch bends to ground

Forms irregular 10-foot-tall mound of vegetation covered with white flowers in spring

Covered with persistent, brilliant, ½-inch-diameter, red fruit in fall

Malus 'Sinai Fire'

Hybrid Crabapple

Zone 4

15 feet tall

Beautiful bright orange-red fruit

Glossy foliage

Habit stiff when young

Malus 'White Cascade'

Hybrid Crabapple

Zone 4

White-flowering, with improved scab resistance

Morus alba 'Chapparral'

White Mulberry

Zone 5

20 feet

Distinctly weeping

Bright green leaves

No fruit

Usually grafted on a standard

Morus alba 'Pendula'

White Mulberry

Zone 4

Must be grafted on high stem of species
Slender pendulous branches

Prunus subhirtella 'Pendula'

Higan Cherry

Zone 5

30 feet tall

Most popular variety of Higan Cherry

Several different forms sold under name – vary in color from deep rosy pink to white

Prunus subhirtella 'Yae-shidare-higan'

Weeping Higan Cherry

Zone 5

30 feet tall

Double-flowered form

Often incorrectly sold as *P. subhirtella*
pendula plena

Effective in landscape longer than *P.*

subhirtella pendula

Prunus xyedoensis 'Sidare Yoshino'

Yoshino Cherry

Zone 5

Small tree with white flowers

Most handsome summer foliage of flowering cherries

Excellent resistance to blossom brown rot and shot hole fungus

Salix alba 'Tristis'

Golden Weeping willow

Zone 2

50 to 60 feet

Most common weeping tree in trade Very spreading

Actually composed of at least four distinct clones

Salix babylonica 'Babylon'

Babylon Weeping Willow

Zone 6

30 feet tall

Best of weeping willows

Very fine textured

True clonal cultivar

Salix 'Prarie Cascade'

Hybrid Weeping Willow

Zone 2

50 feet tall

Cross between *S. blanda* and *S. pennsylvanica*

Improved dark green glossy foliage

Very cold hardy

Growth and habit similar to existing forms of golden weeping willow

Sophora japonica 'Pendula'

Weeping Japanese Pagoda Tree

Zone 4

15 to 20 feet tall

Cascading tresses of pinnate foliage

Fits well into small areas

Drooping habit precise and picturesque

Not a prolific bloomer

Dense lustrous foliage

Styrax japonica 'Pendula'

Japanese Snowbell

Zone 5

8 to 12 feet tall

Small but delicate weeper

Flowers pure white

Bell-shaped outline

Tilia petiolaris

Pendent Silver Linden

Zone 5

75 feet tall

Drooping branches form narrow head

Leaves silvery white underneath on long petioles-flutter in slightest breeze

Ulmus glabra 'Camperdowni'

Scotch Elm

Zone 4

Usually grafted at 6 to 7 feet above ground level

Small tree, not usually more than 25 feet tall

Heads as wide as tree is tall

Umbrella-shaped frames

Branches twisted and pendulous

Flat crown, weeping extremities, and unusual large leaves give tree distinctive look

Susceptible to Dutch elm disease.

Source: Russell Balge

Regional Specialist,

Western Maryland Research and

Education Center,

University of Maryland

SUBSTRATE SELECTION

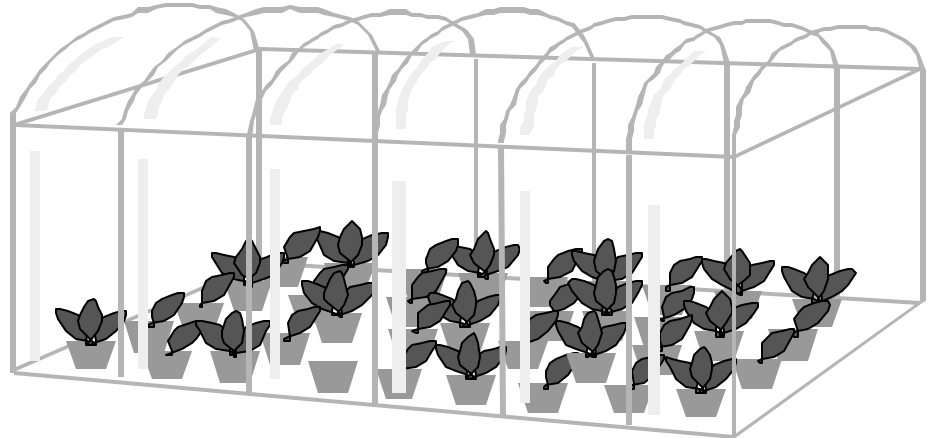
INTRODUCTION

Substrates:

- Provide plant support
- Hold water for plant use
- Provide aeration
- Hold plant nutrients
- Larger soil particles provide better aeration but poorer water retention
- Addition of vermiculite (horticultural grade), bark, or perlite (horticultural) will increase aeration
- Two types of substrate:
 - Soilbased: contains a portion of field soil
 - Soilless: no field soil added
- Grower must determine which substrate will meet their cultural habits
- Infrequent watering practices require high moisture substrate
- Frequent watering practices require a peat moss or bark based mix
- Several substrates should be tested by the grower
- Watering practices may need to be altered so one substrate can be used in potting a wide range of crops

SOIL-BASED SUBSTRATE

- Used to grow only a small portion of potted plants
- Most cut-flower crops are grown using a soil-based substrate
- Contain equal parts:
 - Loamy field soil
 - Concrete-grade sand
 - Sphagnum peat moss with added phosphorus
- With sandy field soil, less sand is incorporated
- With soils high in clay, more sand is incorporated
- Sand is used to promote good aeration
- Sand substitutes include perlite and polystyrene
- Desired pH range is between 6.2 to 6.8
- Micronutrients need to be added
- Limestone is added to adjust pH



SOILLESS SUBSTRATE

- Reduced shipping cost due to lighter weight than soil-based substrates
- Ready to use
- Mixture requires saturation before use
- For more even distribution of components, mix coarse components (sand or perlite) before adding water
- Incorporate organic matter or clay to provide nutrient retention (peat moss, calcined clay)
- Add sand, perlite, or polystyrene to increase aeration
- Add a second organic material or clay to increase water holding capacity (peat moss, calcined clay)
- Limestone is added to adjust pH
- Micronutrients need to be added

COMMON SOILLESS FORMULAS

- Peat-Lite Mixes
 - Mix A: 50% sphagnum peat moss: 50% vermiculite
 - Mix B: 50% sphagnum peat moss: 50% perlite

BARK BASED MIXES

- Less expensive than peat substrates
Fir, pine, and other hardwood bark is most commonly used
- Good aeration, nutrient, and water holding capacity
- To increase the water holding capacity,

add sand, vermiculite, or peat moss

- Greenhouse crops require the addition of vermiculite or peat moss and sand to add moisture and nutrient retention

SUBSTRATE MIXES AVAILABLE

- Germination substrates:
 - Fine vermiculite and peat moss
 - High fine texture uniformity to insure even water retention in plug trays and appropriate placement of seeds
 - High cost of ingredients
- High moisture substrates:
 - Vermiculite and peat moss
 - Larger particle size to increase aeration in the larger pot size
 - Proper watering is necessary to avoid over wet and dry conditions
- Peat moss-based substrates:
 - ie: Vermiculite, peat moss, and perlite
 - ie: Peat moss and perlite only
 - Easier to regulate watering requirements
- Bark-based substrates:
 - Contains vermiculite, bark, and perlite
 - Lower price than peat moss substrates

(Continued on page 5)

THE WATER IN NUTRIENT MANAGEMENT

The Water Quality Improvement Act of 1998 (WQIA) has established the requirement for nutrient management plans and the key word to many people is nutrients. While the application rate of nutrients is an important issue, nutrients move in water. Water is at the center of this issue and must be given full consideration. Nutrients may leach out of containers with overwatering or rainfall. Nutrients may be carried offsite in surface runoff. Most of the danger of pollution centers on the flow of water. Two of four areas that a plan must address deal with water.

The issue of water management in a nursery operation is concerned about: 1. surface water runoff, both from irrigation application and storm water, and, 2. irrigation system operation and management. A risk management assessment approach is being used to identify what risk of nutrient loss is present. The risk assessment process in developing a nutrient management plan is to examine the fixed and variable factors that center on water movement on the nursery site and to assign risk values to each factor. The total sum of risk values will indicate the relative danger of pollution from a given nursery operation. The end product - the Plan - will help the nursery owner identify high risk factors that might be addressed to improve the overall management and profitability of the nursery business.

An examination of the physical site will reveal the pathways for water to leave the site after irrigation events and after a storm event. Factors effecting the surface water runoff may include lined or non-lined waterways, including grassed, rock lined, bare earth and piped. Water runoff from parking lots and roofs of building may be separate from or mixed with nutrient laden water from growing areas. Water may flow into collection basins where sediment settles out and the water possibly is reused. Water may flow directly from the property into a stream. Erosion may cause washouts and runoff may carry sediments to local streams. There are different degrees of risk with each practice. In the risk assessment process, the pathways by which water travels from the property are identified and a risk value is assigned to each. From a management point of view, the high-risk areas or problem areas are assigned more points and stand out as the places to make improvements.

The irrigation system and its operation are a second area to examine. Each grower hopes the irrigation system was initially designed and built to apply water uniformly to a bed or field. This can not always be assumed to be true. Nozzle or head changes since the original installation may have changed the characteristics of the system. If a system must be run longer to water one area because it is not getting as much water, then that is an indication of a problem. Water may be running off one end of a bed or field in the process. A check of operating pressures can help to identify this problem; water pressures should not vary more than 10 percent from one end of a lateral line to the other.

Sprinkler head spacing to achieve good overlap for application uniformity is another item to check. Cans can be spaced out in the bed or field to catch the irrigation water. Measure and compare the volumes of water in the cans to learn how much variability there is in the application process and where it affects the crop. In the planning process, trickle/drip will be a lower risk than overhead sprinklers. The risk value assigned to overhead sprinkler systems will vary depending on the risk associated with each practice. Overhead application to closely spaced containers will yield a high irrigation efficiency (most of the water goes into the container). Liquid application of nutrients by overhead onto closely spaced containers will be lower risk than onto widely spaced containers.

These are but a few examples of situations that a grower, aided by a nutrient management plan writer, will identify and rate in a study of his/her operation. In a worst case scenario, the grower will learn there are several areas in which improvements would lower his/her risk of polluting. Most growers have taken action already to conserve water and nutrients and to protect their land from erosion. This process will document that activity. Other areas in the risk assessment process are substrates and nutrients. These will need to be assessed also in a similar manner.

(Continued from page 4)

- Composition depends on bark size
- More composted, finer bark holds more water, is similar to peat moss and combined with vermiculite
- Coarse, less composted bark is used with perlite or polystyrene which have less water retention and greater aeration
- High aeration substrates:
 - Vermiculite, larger bark, and perlite
 - High aeration and good drainage
 - Inexpensive substrate
 - Good for plants in large containers

Source: Thomas M. Blessington, David L. Clement, Rondalyn M. Reeser, and Corey E. Reeser

(Continued from page 1)

different ways, allows addition of notes about the plants for your own use, and has a database of 3,489 plants.

Upon booting up the software program you are greeted with the screen shown above. The image is printed with permission from Horticipia. The “Garden Workbench”, shown on the left side of the working screen, provides the ability to search for plants based on these selection criteria:

Bloom Time

Bloom Color

Summer Leaf Color

Fall Color

Soil Moisture Needs

Plant Form or Shape

Soil Composition

Tree, Shrub, or Groundcover selection

Height

Spread

Exposure (Sun, Half-sun, Shade)

As an example, to select “Fall Color” place the mouse pointer

on one of the five leaf icons: a small window will appear to let you know the fall color that the icon represents. If you click on it, the leaf icon (or any other of the icons selected) will be outlined in green. When you click on an icon, a search is soon completed and shows all the plants that fit your criteria in the “Plant List” on the right. You can set this list as Botanical or Common Names.

The number of plants in the Plant List is shown in a small box in the middle of the screen. The first box visible above the Height Bar graphic has numbers in it - when the program is first booted up, it should read 3,489 (at least in my current version). This means that there are that many plants in the database. When one of the criteria is entered for selecting plants, e.g., fall color as above, then those plants are selected out of the database and the number of plants in the small window diminishes to meet the selection criteria.

In the top portion of the graphical interface are other Tabs (in addition to the Leaf & Bloom tab already mentioned) for : Features, Zones & More, and Details.

(Continued on page 7)

(Continued from page 6)

The "Details" tab brings up five additional tabs with a wealth of information. It can be used to select characteristics such as Leaf Margins, Leaf Venation, Leaf Type, Leaf Shape, Leaf Arrangement, Fruit Color, Fruit Consistency, Fruit Shape, Trunk, Current Year Twig Thickness, and Leaf(let) Length.

Just above the Number Of Plants box are seven button icons that cause certain actions. Going up from the Number Of Plants box, they are:

CLEAR: This will clear all of your selection criteria and return the Plant List to the full number of plants.

SWITCH NAMES: changes the names in the Plant List between Botanical and Common.

MY LIST: By clicking this button, you can switch between your list of selections and the full list of plants.

THUMBNAILS: If you highlight certain plants in the Plant List (click once on a plant), then clicking the Thumbnail Button will show small pictures of the highlighted plant(s).

ATTRIBUTE BUTTON: offers a very useful graphical view of the plant's characteristics on the left screen display when the button is clicked. All the features that apply to the plant selected from the Plant List are colored in green with a green outline. Features which do not apply are shaded gray. Where characteristics are presented in a text form (e.g., under the Features Tab) the text which applies is outlined in green while the data which does not apply is crossed out.

SOUND: Will pronounce the botanical name of the plant selected (of course, you need speakers...)

ACTION: Will provide written text on the monitor about the plant selected in the Plant List.

The following graphic illustrates some of the plant information available for a selected plant.

The graphic comes directly from the program which allows you to make a "Print Layout" whereby you can post pictures, INFORMATION about the plant, a GROWTH AREA graphic based on the USDA Plant Hardiness Zone Map and also INDIVIDUAL NOTES. I did not post the individual notes function onto the sheet because of the additional room needed. Note that you can add text to the Print Layout Page. This could be useful for architects, designers, or nursery people in mer-

The screenshot shows the HorticoPIA software interface. At the top left is a "Picture" window showing a photograph of an Acer tataricum ginnala tree. To its right is a "Growth Area" window showing a map of the United States with a shaded region indicating the tree's hardiness zone. Below these are two "Information" windows. The first window, titled "Information" Feature, provides detailed data for Acer tataricum ginnala, including its family (Aceraceae), common name (Maple, Amur), and various characteristics like leaf color, bloom time, and growth rate. The second window, titled "More Info" Function, provides additional details such as form, native habitat, and pest/disease information.

Acer tataricum ginnala		Species
Aceraceae		Maple, Amur
Maple		
"Information" Feature		
Summer Leaf	Green	Height 15' to 25' / 4.60m to 7.60m
Fall Leaf	Red, Attractive fall colors	Spread 15' to 25' / 4.60m to 7.60m
Bloom Color	White	Exposure Full shade to full sun
Bloom Time	Spring	Moisture Grows in moist soil
Fruit Color	Pink	Soil & Climate Soil Condition: Acidic, Alkaline, Clay, Loamy, Neutral, Sandy, Well drained, Acidic, Alkaline; Medium salt tolerance; Tolerates moderate drought
Growth rate	Average growth rate	
Attributes and Features		
<ul style="list-style-type: none"> - Not North American native - Moderately flammable - Fragrant flowers - Inconspicuous flowers or blooms - Attractive fruit - Multiple trunks - Trunk is not showy 		
Hardiness Range		
3A to 8A		
-40.0 to -9.4°C		
HORTICOPIA® Trees, Shrubs and Groundcovers II		
©1998 HorticoPIA, Inc.		
Acer tataricum ginnala		Species
Form		
Rounded, Spreading or horizontal		
Plant Type		
Tree		
Native Habitat		
China, Mongolia, Manchuria, Japan, Korea		
Pests and Diseases		
Pests:		
Amur maple is usually pest-free. Fourlined plant bug can cause serious defoliation.		
"More Info" Function		

chandising.

The "Information" window provides data about Height, Spread, Hardiness Range, Soil & Climate, Attributes & Features, and Ornamental Value. The "More Info" window describes Form, Plant Type, Leaf Identification, Other Identification, Native Habitat, and Pests & Diseases.

Note that the plant listed may look unusual to you in terms of the boname. The listing however, is quite up to date, and reflects the new name for Acer ginnala. This might be a problem in a search for this plant in the Plant List using the Botanical Name. It is listed by the new name and so you might assume that it is not in the database. You could find it by the common name (which has not changed). The old name is listed in the Information record for this plant by the new name.

SOME OF THE OTHER FEATURES AVAILABLE

SMARTCARDS: a special function is available to help you learn to use the various functions of the program. When you move to various functions, a window appears with information on what the various buttons will do, and how to take advantage of the data provided, e.g., in getting data onto a Print Layout sheet. The picture of the opening screen shows a Smart Card in the lower right hand corner.

(Continued on page 13)

WATER QUALITY IN THE GREENHOUSE ENVIRONMENT

INTRODUCTION

Grower must monitor the water supply for potential problems

Problems may include high soluble salts, excessive hardness, toxic ions, or other pollutants

SOLUBLE SALTS (SS)/ELECTRICAL CONDUCTIVITY (EC)

- Measures the amount of salts dissolved in water
- Low readings mean there is little salt in the water, which creates nutrient deficiencies
- With a high reading, plant dehydration occurs
- EC readings can be used as a tool to help determine fertilizer requirements
- Fertilizer increases the EC reading
- To reduce the EC readings, the medium can be leached with clear water to remove excess salts
- SS/EC meter:
 - Easy to use
 - Probe contains 2 electrodes
 - Measures electrical conductance between the electrodes
 - The more salt, the greater the flow, and the higher number
 - Necessary production tool
- Check EC on a regular basis to ensure the proportioner is operating correctly
- Take EC reading of the water after it passes through the fertilizer injector — To estimate the ppm of salts, multi-

ELECTRICAL CONDUCTIVITY OR		
EC MEASUREMENT		RATING
mmhos/cm ²	ppm	
0 - 0.25	0 - 175	Excellent
0.26 - 0.6	182 - 420	Good
0.61 - 1.5	427 - 1050	Fair
1.5 +	1120 +	Poor

WATER HARDNESS

- Amount of calcium and magnesium compounds in the water
- Hard water does not injure plants
- Hard water can increase soil pH and leave unsightly residue on the leaves

pH CONTROL

- pH is a measurement of the concentration of hydrogen ions in a solution
- Use pH meter to measure pH
- pH scale ranges from 0 (most acidic) to 14 (most basic) with 7 being neutral
pH of 5.5 - 6.5 is recommended
- Water pH is commonly lowered by adding acid prior to irrigation
- Phosphoric acid is recommended

ALKALINITY

- Alkalinity: measurement of a water's capacity to neutralize acids
- Alkalinity is the sum of the carbonates and bicarbonates (total carbonates)
- Total carbonates of essential elements form as water pH increases, causing nutritional deficiencies
- Alkaline (also referred to as a basic): indicates a pH over 7.0
- Alkalinity causes buffering, which affects the amount of acid necessary to change the pH of the water
- Buffering: how much a solution can resist a change in pH. The greater the alkalinity, the greater buffering ability of the water, the more acid is required to lower pH of the water

**Source: Thomas M. Blessington, David L. Clement, Rondalyn M. Reeser, and Corey E. Reeser
Central Maryland Research and Education Center University of Maryland**

PESTICIDES FOR CONTROLLING INSECTS AND MITES IN INTERIOR LANDSCAPE

The ground rules

First off, it is not legal to use pesticides registered for greenhouse use in interior landscapes unless the label specifically indicates such use. Select a pesticide that is registered for this use. When possible, apply only during non-business hours or when the public is not near the area to be treated. It is wise to cordon off treated areas until the pesticide has dried, even if it does not specifically state this on the label.

There are several pesticides that can be used on indoor plants if a greenhouse is available. Moving plants into greenhouses or outdoors for treatment not only increases the number of pesticides that can be used, but also reduces the potential hazards to the public. In addition, moving the plants eliminates the possibility of damaging carpets, woodwork, and interior furnishings.

Pesticides That Can Be Used in Interiorscapes

Oils

Horticultural oils are paraffinic oils that kill insect and mites by contact. The pest dies only if present at the time of application. Pests migrating to a recently treated plant are usually unaffected by the oil residues. The pesticidal action of oils is mainly physical, but it may also be chemical. Suffocation is the most widely favored theory explaining how oil kills insects and mites. Oil blocks the spiracles, reducing the availability of oxygen and preventing exchange of gases for metabolic processes. Suffocation results within 24 hours. Mite and insect eggs suffocate when gas exchange through the egg membrane is prevented. SunSpray UltraFine oil is labeled for use in interiorscapes and greenhouse. Oils are very good for controlling mites, sessile stages of whiteflies, some aphid species. It

works well in combination with Enstar II in controlling mealybugs.

Entomopathogenic fungi

Beauveria bassiana, sold under the trade name BotaniGard 22ES and 22WP, are labeled for whitefly, aphid and thrips control in interiorscapes. The material needs to be applied using a fine mist sprayer and contact with the insect is an "absolute must." The entomopathogenic fungi works well in humid interiorscapes.

Pyrethroids

A number of the pesticides registered for interior use are pyrethroids. One product, X-Clude PT 1600A (Whitmire), contains a natural pyrethrum, an insecticide derived from *Chrysanthemum* daisies. It is an aerosol with timed released, encapsulated particles of insecticide. Insects pick up capsules by walking across treated foliage; they are killed on contact or as a stomach poison. Flying insects are repelled from treated foliage. Ordinarily pyrethrum breaks down within a few hours after exposure to sunlight but the capsules which contain the pesticide are UV resistant, and a treatment lasts for weeks. It is also much safer than regular pyrethrum with an LD50 over 34,000 mg/kg. X-Clude PT 1600A is best used to control aphids, spider mites, and whiteflies. Avoid wetting foliage with spray.

A number of synthetic pyrethroids are available for use in interior landscapes. These include fluvalinate, permethrin, d-phenothrin, and resmethrin. These products, with the exception of fluvalinate, have virtually no residual effect, and applications must be repeated frequently. Fluvalinate (Mavrik 2F, Sandoz) must be used with extreme caution in interior situations. The pesticide label states that it can be used to control aphids, mites, thrips, and whiteflies in indoor landscapes. However, moderate to severe skin and throat irritation may occur during and following use. People who apply

the material, as well as those who enter treated areas following application, may have reactions. A respirator, rubber gloves, and protective clothing should be used. Persons other than the applicator

"Ordinarily pyrethrum breaks down within a few hours after exposure to sunlight but capsules which contain the pesticide are UV resistant, and a treatment lasts for weeks."

should not be present at the time of application.

Permethrin (Praxem 1 EC, Roussel Bio-Corp.) will control most whiteflies and leafminer adults. D-phenothrin (PT 1400 Sumithrin, Whitmire) is a broad-spectrum aerosol used to control aphids, spider mites and whiteflies.

Two resmethrin products are registered for interior use: SBP-1382 Insecticide 2EC (Roussel Bio-Corporation) and Resmethrin 2EC (Miller Chemical & Fertilizer Corporation). Resmethrin can be used to control fungus gnat larvae, thrips, and whiteflies. Best results are obtained if temperatures are cool (50 to 72 F) Resmethrin has relatively low mammalian toxicity and is an ingredient in many home and garden products for houseplants.

Organophosphates

Knox Out PT 1500R is a timed release, microencapsulated formulation of Diazinon, an organophosphate. It is an aerosol that can be used to control fungus gnat larvae, leafminers, and thrips; it can be very effective against adult scales and mealybugs. Avoid wetting foliage with

(Continued on page 10)

(Continued from page 9)

spray.

Insect Growth Regulators

Enstar 5E (kinoprene), is another pesticide manufactured by Sandoz Crop Protection Corporation; it is registered for use in atriums. It is an insect growth regulator that can be used to control fungus gnats and is especially effective against Homoptera, including aphids, mealybugs, scales, and whiteflies. Although effective against immature whiteflies, it has no ovicidal effect. Enstar can also be combined with a pyrethroid to reduce adult whiteflies.

For mite control, Hexygon, by Gowan Company is a relatively new mite growth regulator that is label for use in interiorscapes. It impacts the immature stage of the spider mites and should be used when mite populations are small. It will last for 30 –40 days and is very effective in controlling two-spotted spider mite and citrus mite.

Insecticidal soaps

Insecticidal soap (Safer's Insecticide Concentrate, Mycogen, and Insecticidal Soap 49.52 CF, Olympic) can be used to control aphids, mealybugs, spider mites, and whiteflies. It contains potassium salts of fatty acids which get into the cells of soft-bodied insects and cause them to burst. Thorough coverage is necessary, as the soap acts only by contact. This material works well in an integrated pest management program because natural enemies can be re-introduced after an application without any harmful effects. In addition, it can be used for spot treatments or for application in areas where more toxic pesticides cannot be used. Repeated use may remove the wax layers from leaves and/or cause plant injury. Also, heavy spray runoff can be slippery unless cleaned up properly.

In addition to these pesticides, noncommercial products generally available to the homeowner for use on houseplants can be used in commercial interior landscapes. Although these pesticides are expensive for large-scale situations, they are useful for spot treatments. They also save labor, as many come ready-to-use with no mixing and no special equipment needed.

**Source: Stanton Gill, Regional Specialist
Central Maryland Research and
Education Center, University of Maryland
Cooperative Extension**

MAKE THE CONNECTION

Visit the University of Maryland,
Central Maryland Research and
Education Center's Commercial
Web Site

- ◆ Weekly Greenhouse, Nursery and Landscape IPM/TPM/ Reports
- ◆ Conference and Short Course Listings
- ◆ Green Industry News—Online
- ◆ Fact Sheets
- ◆ Cut Flower Production Information

GYPSY MOTHS IN YOUR AREA?
TO VIEW THE 2000 GYPSY MOTH SUPPRESSION MAP
FOR MARYLAND, VISIT THE CENTRAL MARYLAND
RESEARCH AND EDUCATION CENTER WEB SITE AT:
HTTP://WWW.AGNR.UMD.EDU/USERS/IPNMET

THE HOME AND GARDEN INFORMATION CENTER AND YOUR CUSTOMERS



The University of Maryland Cooperative Extension's Home and Garden Information Center (HGIC) is a centralized hub for home horticulture information accessible to the entire state via a toll free phone number and website. Your customers can benefit from the HIGC by getting unbiased research-based answers to their plant and pest questions. The number is **1-800-342-2507**. Horticulture experts are available weekdays from 8:00 a.m. to 1:00 p.m.

Our website is multifaceted. There is a section on the Chesapeake Bay, Master Gardeners and a timely tips section that posts helpful gardening and pest control tips for a two-week period, and a unique photographic key that helps to diagnose common plant and landscape pest problems. The website address is: www.agnr.umd.edu/users/hgic. Portions are still under construction. The sections that are completed include beneficial organisms, broadleaf shrubs, shade trees, needle evergreen trees, pest control and wildlife. The next sections to be available will be flowers and herbs, and turf. Our website has links to other websites that may be of interest.

The HGIC also produces Extension fact sheets on a wide range of topics that include: plant insect pests, plant diseases, turf, fruits and vegetables, aquatic gardening and landscape ornamental plants. You may call or write for a complete listing of our publications. You can also view

Fact sheets can

Source: **Raymond Bosmans**

Regional Specialist

Home and Garden Information Center

University of Maryland Cooperative Extension

(and print) many of them on line.
also be ordered via the web site.



HONEY LOCUST PEST IN MAY

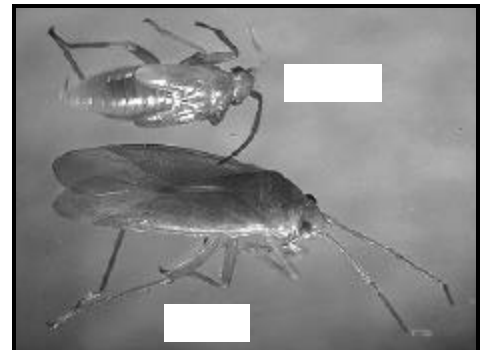
Has your customer's honey-locust tree shown discolored, stunted or deformed growth during May in past seasons? Two insects, *Diaphnocoris chlorionis*, the honey locust plant bug, and *Macropsis fumipennis*, the honey locust leafhopper, are usually the causal agents of leaf distortion on honey locust. The adult honey locust plant bug is about ¼ inch long, green, with wings held flat on its back. The immature insects are green with short wing buds that do not reach the end of the body. The leafhopper is also green but with an elongated shaped body and two small hair-like antennae. These insects may be found together on the same tree, making it difficult to distinguish the injury caused by each individual pest. The eggs of these pests are laid on the bark of the tree and hatch in late April. These two insects actively feed on honey locust foliage from May through July. Fortunately, only one generation occurs each year.

Control options (one of the following may be applied for control):

- Horticultural oil applied at a summer rate
- Chlorpyrifos (Dursban or Pageant)
- Cyfluthrin (Tempo 2)

Soil Injection

Soil injections of imidacloprid (Merit 75 WP) applied 60 days before feeding activity of these two pests will give control.



The Honey Locust Plant Bug

Photo by John Davidson

Source: **Stanton Gill, Regional Specialist Central Maryland Research and Education Center, University of Maryland Cooper-**

Did You Know that adding 1% aluminum buffered phosphorus to your potting medium can not only reduce the loss of phosphorus by leaching but also can increase the growth of rhododendrons and forsythia? Recent concerns for phosphorus leaching into ground waters should make these researching findings of interest. Researchers at Penn State have reported improved growth while substantially reducing leaching of phosphorus from the container-growing medium. Osmocote 36-0-0 and Osmocote 0-0-44 were used to supply nitrogen and potassium. Aluminum buffered phosphorus keeps phosphorus available in a bound but available form thus minimizing leaching. (Adapted from J. Environ. Hort.17: 153-157. Dec. 1999.)

Did You Know that there has been recent interest in the growing of Atlantic white cedar (*Chamaecyparis thyoides*) for reforestation? Natural stands of native western Atlantic white cedar in Maryland are nearly extinct. Some nurserymen have attempted to propagate these from seed with little to no success. The answer might be the need for a longer stratification period and exposing the seeds to light during the germinating period. Researches at N.C. State reported that North Carolina seed sources required 60 to 90 day stratification time at 39° F while the Alabama seed source required only 30 hours at the same temperatures. However, the germination of both sources was enhanced when the seeds were left uncovered after sowing. It could be that the Maryland strain of *C. thyoides* requires a minimum of 90 days of stratification and the seeds should not be covered after sowing. (Adapted from J. Environ. Hort.17: 158-163. Dec. 1999.)

Did You Know that only two species *Pistacia chinensis* and *Platanus occidentalis* benefited from growing in aluminum Accelerator containers. *Fraxinus veltutina*, *Quercus virginiana* and *Ulmus parviflora* seedlings grew equally well or better when grown in traditional black plastic containers of similar size. Although an aluminum coated Accelerator container may help to reduce growing medium temperatures, it is evident that

DID YOU KNOW

not all species respond equally. (Adapted from J. Environ. Hort.17: 168-173. Dec. 1999.)

Did You Know that sub-irrigation of container grown plants can provide up to 95% weed control? Research at the University of California compared mulch materials and corn gluten as potential weed control methods in container culture. Organic mulches and fiber discs treated with Rout provided broadleaf control while corn gluten provided grass control. However, it was observed that containers that were sub-irrigated had 95% fewer weeds than those that were over-head irrigated. (Adapted from J. Environ. Hort.17: 174-180. Dec. 1999.)

Did You Know that applying Ronstar, at the recommended rate within 1 to 15 days after transplanting pampas grass into containers filled with pine bark/sand (6/1) did not cause lodging or club root formation. Other herbicides such as Pendulum, and Factor 65 caused both lodging and club root formation. (Adapted from J. Environ. Hort.17: 185-189. Dec. 1999.)

Did You Know *Stewartia pseudocamellia* seeds germinate better if you expose them first to a 3-month warm moist stratification period at near 60° F before placing them under a 45° F for 300 days? Many Maryland nurserymen have had poor success in propagating this species from seed and the reason could very well be that the warm stratification period was generally too short. When germinating *S. pseudocamellia* seeds, patience is a virtue because the germination time may take as long as 165 days. (Adapted from

J. Environ. Hort.17: 197-202. Dec. 1999.)

Did You Know that Nep1 may become a new biological herbicide that can be added to or replace some of the herbicides we now use to kill broadleaf weeds. Nep1 is derived from secretions generated from the fungus *Fusarium oxysporum*. Researches at USDA Beltsville have removed a protein-making gene from the fungus resulting in Nep1 capable of being used on a wide variety of monocots without transmitting the disease. When applied to the foliage of broadleaf weeds such as dandelions, Nep1 causes the sudden collapse of so many cells that the leaves die within 3 to 24 hours. Adding Nep1 to Roundup and 2,4-D increases their effectiveness. (Adapted from Agricultural Research, Feb. 2000)

Did You Know that Deer Away and Holly Ridge were the only two available deer repellents that significantly reduced browsing by deer. Tree Guard and Deer Off only reduced browsing when feeding

Did You Know that sub-irrigation of container grown plants can provide up to 95% weed control?

intensity was low. (Adapted from J. Environ. Hort. 18:5-8 March 2000)

Did You Know that the leaching of nitrogen from containers can be reduced by maintaining a constant moisture tension in the growing medium by using fertilizer solutions with electrical conductivity (E.C.) near 1.25 dS/m. Maintaining an E.C. of near 1.25 dS/m as compared to an E.C. of near 2.0 dS/m resulted in the fertilizer solutions containing 220 and 110 g N/m³ resulted in good growth with minimal nitrogen loss by leaching. (Adapted from J. Environ. Hort. 18:8-12 March 2000)

Did You Now that bittercress (*Cardamine hirsuta*) can be controlled in container

(Continued on page 13)

(Continued from page 12)

grown liriopse, azalea and holly by spraying with Gallery? Gallery applied at the 1-lb./A rate did not cause injury to the ornamentals. The degree of bittercress control was dependent on the size of the weed. Smaller weeds are killed more easily by this herbicide than larger weeds.

(Adapted from J. Environ. Hort.18: 23-28. March 2000)

Source: Frank Gouin, Professor Emeritus, Department of Natural Resource Sciences and Landscape Architecture,

SOFTWARE

(Continued from page 7)

LISTS: On the top menu, is a category labeled Lists which has several plant lists that may be called up, e.g., grasses, ferns Southwestern the various buttons will do, and how to take advantage of the data provided, e.g., in getting data onto a Print Layout sheet. The picture of the opening screen shows a Smart Card in the lower right hand corner.

LISTS: On the top menu, is a category labeled Lists which has several plant lists that may be called up, e.g., grasses, ferns Southwestern plants, FFA National Plant List, etc. The later would be very useful for teachers and students in FFA (Future Farmers of America) programs to review the plant material in this program.

SLIDESHOW: A function is available to allow the program to cycle through the pictures with an almost full screen view. As each picture is shown, the Botanical name is pronounced for each plant - this can be turned off however.

Much more could be mentioned about the capability to configure the on screen display to your needs and desires as well as other features but these will be more useful as you work with the program. In conclusion, you will be hard pressed to find features missing in this program. Horticipia Trees Shrubs and Groundcovers II sells for \$180.00. You may find out more about this program by visiting their web site: <http://www.horticipia.com> or call

Nursery and Greenhouse Nutrient Management Program Year 2000 Summer Meeting Dates

A series of Summer Meetings will be held for members of the following associations, at which nutrient management presentations will be made. Short presentations on the nutrient management planning process will be made at the May and June Meetings.

The July "Open House" meeting will allow any person interested in becoming a certified nutrient management planner the opportunity to look at the course materials (which are delivered over the Web) in a hands-on computer session.

People who register for the nutrient management planning course in Fall will be required to attend a one-day WebCT training session on the 25th August at the College Park campus. The course will start on the 30th August and run through the 15th December. Participants can complete the course over the Web, but they will be required to attend five ½-day plan-writing sessions during the course.

Specialist / Association Meetings:

- Maryland Nurserymen's Association
15th June, 2000
Venue: Wye Research and Education Center, Queenstown
Time: 4:30 - 6:30 pm
- Maryland Greenhouse Growers Association
27th June, 2000
Venue: Carroll Community College
Time: 8:30 am - 4:15 pm

Nutrient Management Planning Meetings:

- Nutrient Management Planning Course Open House
6th July, 2000
Venue: NRSL Department, University of Maryland, College Park
Time: 4:00 - 7:00 pm
- Nutrient Management Planning WebCT Training
25th August, 2000
Venue: NRSL Department, University of Maryland, College Park
Time: 9:00 am - 3:00 pm (Lunch provided)

For further information on these meetings or about the nutrient management process, please contact Dr. John Lea-Cox at 301-405-4323 or via email at jl207@umail.umd.edu

**Sources: David S. Ross, Department of Biological Resources Engineering,
John Lea-Cox, Department of Natural Resource Sciences
and Landscape Architecture,
K. Marc Tefteau, Wye Research and Education Center,**

ANNOUNCEMENTS

**Procrastinator's Pesticide
Recertification Conference**

June 2, 2000

Location: Montgomery College,
Germantown

Contact: Steve Dubik, 301-353-7803

Greenhouse Short Course

June 21, 22, 26, 28, 29, 30, 2000

Location: Maryland Department of
Agriculture, Annapolis, Maryland

Tour: On June 26 there will be a tour of
three area greenhouses led by
David Ross, Agricultural Engineer, who
will cover greenhouses structures and
equipment.

Topics: Marketing, Insect, Disease and
Weed Control, Business Management,
Scheduling

Contact: Suzanne Klick, 301-596-9413 or

sk85@umail.umd.edu

**Maryland Greenhouse Growers'
Association Conference**

June 27, 2000

Contact: Hank Doong, 301-249-2492

**Association of Specialty Cut Flower
Growers Regional Conference**

August 7, 2000

Location: Virginia, exact site TBA

Contact: Bob Wollam, 540-937-3222

**Maryland Cooperative Extension Cut
Flower Tours**

August 8, 2000

Location: Tour will begin at CMREC in
Ellicott City and travel to north and
central Maryland

Contact: Suzanne Klick, 301-596-9413

This information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Maryland Cooperative Extension Service is implied.

For additional assistance and information on floriculture and ornamental plants, contact the County Extension Office. Their address and telephone numbers are listed in your telephone directory under your County Government.

Sincerely,

Thomas M. Blessington, Professor and
Regional Specialist, CMREC

Stanton A. Gill, Regional Specialist, CMREC



Russell Balge, Regional Specialist, WMREC



K. Marc Tefteau, Regional Specialist, Wye Research
and Education Center