

**FROM THE DESK OF THE PRESIDENT**  
**Christopher Valenti**  
**President, D.A.N.**

It has been a busy spring for your D.A.N. Board. I will give you the highlights:

**Plant of the Year:** We will receive the final flyers soon. These beautiful, full color prints show our 1995 selections with an accompanying description. They can be mounted on foam core as a counter sign or used as attractive handouts at garden centers or by landscapers. Our custom plant of the year pot and tree tags will be available shortly. Selections for 1996 will be made this summer and all promotional materials will be ready by January, 1996.

**President's Council:** The D.A.N. Board has approved the formation of a council composed of the past presidents and current president and vice-president of the D.A.N. This Council will provide an opportunity for continued volunteer support by those individuals who have provided years of dedicated service to the membership. This Council will be advisory and will target an annual project to benefit D.A.N. and the membership. Jamie Jamison, past president, has agreed to act as the first chairman of the Council.

**Industry-wide Nursery Survey:** Marianne and I met with Jack Tarburton, secretary of agriculture, to discuss a comprehensive survey of the nursery industry. Secretary Tarburton agreed that the survey would help the industry on many levels and should be pursued. The Delaware Department of Agriculture will administer this survey, requiring a part-time employee for the summer of 1995 to begin gathering business names and addresses. The Department of Ag and D.A.N. plan to fund this survey equally. The newly formed President's Council plans to coordinate fundraising for the survey. With support from D.A.N. membership

and corporate sponsorship, fundraising should be successful. Since the nursery industry is estimated to be the third fastest growing agricultural industry in Delaware, the time is right for this survey. You, along with other members and corporate sponsors, have the opportunity to help prove that the nursery industry is committed to success and to the future.

**Ag Days at the Mall:** The D.A.N. manned a booth at Christiana Mall in April. We distributed flyers showing the 1995 Plant of the Year. The flyers also list all D.A. N. garden centers and landscapers to provide locations for people interested in purchasing plants of the year.

We hope your 1995 spring season is successful. If you want to help with fundraising for the Nursery-wide Industry Survey, just call!

**ASSOCIATION NEWS**  
**Marianne McGloin**  
**Executive Director, D.A.N.**

Hello to all the members of the D.A.N.! As you know, I have replaced Linda Pevey as Executive Director. I am very excited to accept this opportunity. My background is primarily in business administration. In the last eight years, I have worked in the defense and medical software industry. I am a native Bostonian, and I graduated from Bentley College with a bachelors in Management. My family and I have settled quite nicely in the Dover area.

My goals for 1995 are to enhance awareness of this association in the state, increase membership and increase attendance at our functions. Please feel free to call with any questions or concerns you may have.

The D.A.N. began its first annual Plant of the Year Campaign in 1995. Through a process involving a selection committee and voting by D.A.N. members, *Magnolia virginiana* and *Coreopsis verticillata* 'Moonbeam' were chosen as the first D.A.N. Plants of the Year. These plants were announced at the Delaware Horticulture Industry Expo on January 18, 1995. A marketing package for members to use to promote these plants will be available shortly. Look for details and order forms in the mail.

John Apgar and I recently represented the D.A.N. at the 25th annual Delaware Farm Council Dinner at the Sheraton in Dover. Good news for all small business owners was announced. The House just passed a bill (H.R. 831) restoring a 25% tax deduction for health insurance premiums for the self-employed. (The deduction had been allowed until 1993.) This bill makes the deduction permanent and retroactive for 1994. The bill is now in the Senate for approval.

The D.A.N. had a great turnout at this year's Hort Industry Expo. Approximately 130 people attended. Everyone was pleased with the educational seminars and banquet facilities. January 18 and 19 have been reserved in 1996 for the 1996 Expo. If anyone is interested in reserving a booth at the trade show, please call. Renewals will be sent to this year's exhibitors shortly.

The CNP exam was given on March 1. Congratulations to the new CNPs. The next scheduled exam date is October 25, 1995 at the Department of Agriculture in Dover. Manuals are available for \$50 each.

On September 16, 1995 the 2nd Annual Auction to benefit the Research and Education Fund will take place at the Delaware Center for Horticulture. Diane Hill will be coordinating

the event. It was a great success last year and we hope to make a repeat performance.

## **CONGRATULATIONS TO THESE CNPS!**

New CNPs:

**Charles Gloyd**, Pleasant Hall Farms  
Garden Center Specialist  
Greenhouse Specialist

**Joe Cook**, Landscape Services, Inc.  
Turfgrass Specialist  
Landscape Specialist

**Chris Sanderson**, DE River and Bay Authority  
Landscape Specialist

**Norm Hedrick**, Norm's Landscape Service  
Landscape Design Specialist

CNPs with new specialty titles:

**Douglas Clark**, DE River and Bay Authority  
Turfgrass Specialist

**Joseph Rybicki**, DE River and Bay Authority  
Turfgrass Specialist

**Robert Mazzetti**, DE River and Bay Authority  
Landscape Design Specialist

### **U OF D NEWS Susan Barton Extension Specialist**

The Ornamentals Short Course series has been divided into three sessions for 1995. Session I will end with Diagnosis & Control of Insects on Woody Ornamental Plants scheduled for April 4, 6, 11, and 13 from 3-5 PM in Worrihow Hall, Newark. Session II will include Lawn Establishment & Maintenance, Woody Landscape Plants, Greenhouse Management,

Poinsettia School and Diagnosis & Control of Diseases on Woody Ornamental Plants. These courses are scheduled from June through August. Registration brochures will be mailed in April. Also look for Session III courses, Pruning & Landscape Maintenance, Basics of Business Management and Ecological Landscape Design in September and October. These courses are designed for the nursery and landscape professional. Take advantage of them. If you wish to use the short courses to study for the CNP exam, you can purchase a voucher that can be used to attend several courses at a reduced rate. Please contact me for details if you are interested.

The UDBG plant sale will be held on April 22 at the College of Agriculture. The sale is designed to introduce new and underused plants to the market. We will distribute a handout of D.A.N. member nurseries that carry many of the plants sold at the sale. We hope to increase the interest in new, native and underused plants and increase business for all! The proceeds from this sale are used to fund student interns that work in the UDBG. This year the UDBG will hire three student interns.

A reception honoring Charles Dunham, professor emeritus, Plant & Soil Sciences Department, University of Delaware will be held at the UDBG on May 12 from 5 to 7 PM. We know this is a busy time for you, but hope you will consider taking a few hours out to honor Charlie Dunham for all the service he provided to the Delaware nursery industry and the University of Delaware. This reception will also serve as a kickoff to a fundraising campaign for the proposed UDBG Entrance Garden to be located at the south end of Townsend Hall. Come see the plans, socialize with friends and colleagues and honor Charlie Dunham. The evening will include appetizers, a cash bar, gift presentation and UDBG garden tour. You will be receiving an invitation in the mail.

**BIOLOGICAL CONTROL**  
**Susan Barton**  
**University of Delaware**

*The following is a summary of a presentation made by Dr. Michael Raupp (professor, University of Maryland), at the Delaware/Maryland Ornamentals and Turf Workshop in November, 1994.*

Biological control is one part of the broader approach to pest management known as Integrated Pest Management. This approach uses a variety of tactics, including resistant plants and mechanical, physical, cultural, genetic and chemical methods to reduce and maintain pest populations. In this management system, eradication of a pest is an unrealistic objective. Biological control involves the use of predators, parasites (parasitoids) and pathogens to reduce, and in some cases maintain, pest populations below damaging levels.

Biological control agents can be separated into three general categories: predators, parasites and pathogens. Predators are often larger than their prey and consume more than one individual or prey during their development. Parasites or parasitoids are usually smaller than their prey and often complete their entire growth and development within a single prey individual. Pathogens cause disease in a pest and include viruses, bacteria, fungi and other microorganisms. Biological control agents occur naturally in landscape systems and many are produced or harvested commercially for use by landscape managers. For more information on specific biological control agents in these three groups see the article entitled "Biological Control - A Promising Strategy For Controlling Insect Pests," by Raupp, M.J. and R.G. Van Driesche from *Tree Care Industry*, January 1991. (*editor's note: A reprint of this article is available by calling Susan Barton at 302-831-2531*).

There are four recognized approaches to biological control: conservation, augmentation, formulation, and importation of biological control agents.

Start with a conservation approach that focuses on conserving beneficial organisms that are already there. Choose pesticides carefully. Cover sprays will knock out many beneficials and often fail to kill the targeted pest unless properly timed for the susceptible pest stage. Use oils and soaps whenever possible. Due to a short residual, they are less toxic to beneficials. Think non-chemical control first. Prune out pest problems such as tent caterpillars or canker. Design problems out of the landscape by selecting appropriate plants and modifying difficult sites. Azaleas are usually plagued by lacebug when planted in full sun. At first researchers thought the plants in full sun were stressed and therefore prone to insect infestation. It turns out that beneficials don't like full sun, so the pests on those azaleas have no natural population control. Plant diverse landscapes to increase the likelihood of natural enemies. Most enemies need alternate hosts, shade and complex sites.

Augmentation is the release of additional beneficial organisms into the landscape or the manipulation of the system to foster the increase of beneficials. For example, adding artificial honeydew and pollen to agricultural crops can stimulate the reproduction of lacewings and lady beetles. Landscapers and nurserymen have had limited success with releasing beneficials. Lack of success is probably caused by the fact that living organisms must be handled differently from pesticides, fertilizers or other products frequently applied to the landscape. Make sure beneficial organisms are still alive before release. Provide plenty of water. Release in the morning, when it is cool and the ground is covered with dew. Release to sites that have an existing populations of pests--the food source for the beneficials.

**EMPLOYEE HANDBOOKS**  
**Susan Barton**  
**University of Delaware**

Formulations are products that can be mixed and applied like pesticides. Bt is a naturally occurring bacterium that controls the larvae of some foliar feeding caterpillars and beetles. Recent advances in technology have enabled manufacturers to produce larger amounts of Bt formulated for a variety of uses in landscape systems. Nematodes in various formulations show promise for control of clearwing borers and black vine weevil.

Many of the key pests of ornamental plants were imported into the United States many years ago. These non-native pests thrive with plenty of hosts but no natural enemies. Importation is the introduction of natural enemies to control imported pests. Stringent quarantine procedures are imposed to prevent the importation of additional problems. Hemlock woolly adelgid, birch leafminer and euonymus scale are serious landscape pests that are potentially good candidates for importation projects. Beneficial insect labs (such as the lab located at the College of Agriculture in Newark) are testing potential natural enemies for importation into the U.S.

The employee handbook is a document that contains policies pertinent to employment at a company. It is one component of an employee training program. The employee handbook was recently the topic of discussion at a Long Island workshop and in an article in the NJNLA newsletter. You may be surprised to learn that many state courts consider an employee handbook to be a written employment contract unless it contains a disclaimer. The disclaimer should state that the handbook is not an employment contract, that all employment is "at will"--workers can be fired for just cause. The disclaimer should also say you reserve the right to modify the terms of the handbook at any time, to keep a court from maintaining that the policies there are binding.

Some states (New York, for example) require that companies write out vacation and sick leave policies. The employee handbook is a good place to write out a sexual harassment policy. It can serve as an insurance policy. If an incident occurs, be sure to follow your own policy and you will be safe from reproach.

## NICHE MARKETING

**Peter Konjoian**

*Editor's Note: After his yearly shopping trip with his daughter for his wife's birthday present, Peter Konjoian reflected on the success of the free perfume samples he and his daughter collected. He gave them to his wife. She used them and chose several fragrances she liked to purchase the next time she went shopping. Sounds like a good idea, eh? Peter chose several new and different crops that will be hard to sell for the first time. He selected plants that won't flower until after the spring rush such as, gomphrena, cleome, cosmos, larkspur, bachelor button and strawflowers. He plans to give out free samples in the hopes that his good customers will come back and buy more next year. Here is the plan.*

I decided on an 1803 pack as my 'perfume vial.' Three plants would make a nice clump in the garden and 18 customers could be serviced with each flat.

The plants will be clearly marked, with signage an important part of the presentation. All employees will enthusiastically describe the trial plants to customers. A tray located near the register will provide the cashier an opportunity to give away plants and tell customers about their virtues. In years to come I see a display bench with all these introductions including photographs, display plants and signage.

Last year I tried something new again in the bedding plant area. It was a big hit. Have you noticed how the list of new vegetable cultivars has exploded in recent years? Take peppers for example. I sell the traditional green to red bell variety but I also carry, yellow, purple, lilac, orange and chocolate. There are many new non-bell sweet peppers and lots of popular hot peppers. To help sell all these new and different peppers, I have scheduled a few display plants of each cultivar to be mature for the May rush.

They were sown in December, are being grown in nine-inch pots and have tomato cages for support. It may take several years to get the timing right so the peppers show their mature colors in May. I have also started selling sampler packs. With all these new varieties, who has the garden space to grow six or twelve of each variety. I took an hour one rainy afternoon and made up mixed packs--six different cultivars each with a label. I ended up with a bell pepper sampler, a sweet pepper sampler and a hot pepper sampler. What a hit! Many customers told me that it was a nice idea and a great way to try new varieties. Other plants such as tomatoes, lettuce or cole crops work well in sampler packs. Just be creative!

Another idea I tried last year was a children's garden. I started with a plastic handled tray (8 x15 inch) and added a six pack containing two tomato plants and one plant each of broccoli, lettuce, pepper and celery. I put in a pot of cucumbers and pumpkins. A packet of sunflower seeds in a Ziploc bag, so it won't get wet when I water, and an inexpensive hand trowel complete the package that sells for \$9.99. For the tomato varieties, I chose Supersweet 100 since kids love to watch cherry tomatoes grow and then I used either 'Better Boy' or 'Early Girl.' The parents get a kick out of this.

Lets get back to the title of this article--Niche Marketing. Decide what you do best and specialize in that area. For my bedding plant crop, I want to be known for having new and unusual items, top quality and availability throughout the spring season. I am still growing impatiens, pansies and petunias because they still pay the mortgage. But, in my customers' eyes, it is the minor crops that are helping me carve my niche.

Excerpted from *VNA Newsletter*, January/February 1995. Reprinted from the *Ohio Florists' Association Bulletin*, Number 775.

**TRACING THE FLOW OF CHEMICALS**  
**How to reduce nitrate and pesticide leaching**  
**Lori Ward Bocher**  
**Turf Science**

By now it seems clear that, in virtually all areas of the country, groundwater is being contaminated by nitrates and pesticides. However, for turf managers, the good news is that various studies show that little or none of the contamination comes from well-managed turf. "With well-managed turf, nitrate leaching and runoff (from fertilizers) are rare events. And the turf system is pretty good at tying up and degrading materials such as pesticides," said Dr. Martin Petrovic in his talk at the Wisconsin Turfgrass & Greenscape Expo '95. Petrovic is an associate professor of floriculture and ornamental horticulture at Cornell University.

But those facts don't let turf managers off the hook. "We can do a good job of further reducing the risk of leaching or runoff," says Petrovic.

**NITROGEN FERTILIZER**

Nitrogen applied to turfgrass has five fates.

- 1. taken up by plants**
- 2. stored in soil**
- 3. lost to atmosphere**
- 4. lost to groundwater**
- 5. lost to runoff**

Various studies have shown that the plant takes up a wide range of the nitrogen applied to it - an average of 30 to 50 percent. "Fertilizer nitrogen is mostly taken up in the first three weeks after application, and soil nitrogen is taken up after that point," Petrovic explained.

Nitrogen is also stored in the soil and the thatch, either as organic matter or as undissolved fertilizer granules. Petrovic pointed out that, in one study, the thatch contained 21 to 25 percent

of the fertilizer nitrogen that had been applied, while the soil held 14 to 20 percent.

Some applied nitrogen is lost to the atmosphere, either by volatilization of ammonium or urea fertilizers, or by the gaseous loss of nitrous oxides. "So there isn't much left to be lost to the groundwater or to runoff," Petrovic said. In fact, in a United States Golf Association-sponsored study on the effect of irrigation after nitrogen application, it was found that 40 to 45 percent of nitrogen remains in the soil; 20 percent in the thatch; and 10 to 15 percent in the grass clippings. Only one or two percent is leached beyond the root zone, and even less is lost to the atmosphere.

**NITRATE LEACHING**

However, there are circumstances under which more nitrogen (nitrate) can leach to the groundwater. According to Petrovic, the six main factors affecting nitrate leaching are:

- 1. nitrogen rate**
- 2. nitrogen source**
- 3. application timing**
- 4. irrigation practices**
- 5. soil texture**
- 6. age of site**

"These first four factors the turf manager has some control over," he said.

**Nitrogen rate:** One study concluded that, at normal Fall fertilizer rates of one pound of nitrogen per 1,000 square feet, there was no leaching. However, at rates two to three times higher, leaching did occur.

**Nitrogen source:** When conditions are right, leaching is not a problem, even with soluble sources of nitrogen fertilizer, according to Petrovic. "However, if you have conditions pretty conducive to leaching, slow-release

sources can reduce the chance of leaching to very little, or effectively none at all. If you can work slow-release fertilizers into your program, it's another safeguard against unusually wet years or a break in your irrigation system," he said.

**Application timing:** "In late fall, when the plant is taking up less nitrogen, applications of fertilizer have a higher risk for leaching in certain areas of the country. Where the winters are milder, the soils are sandier, and there is lots of rain in the fall," Petrovic pointed out. "It's best to get the fertilizer on in early fall under these conditions." However, where the soil texture is finer and the ground is frozen, late fall applications of fertilizer are generally not a problem, he added.

**Irrigation practices:** Too much irrigation can cause leaching. In one study there was more leaching with high irrigation rates than under two different fertilizer application rates. "There is some potential for problems if we irrigate too heavily," Petrovic said.

**Soil texture:** "Soil texture affects the ability of soil to absorb and hold water," Petrovic explained. "The higher the sand content in a soil, the more careful we have to be about leaching."

**Age of site:** Petrovic explained that younger sites have less soil organic matter, and therefore need to be fertilized more; older sites have more soil organic matter, and therefore need less fertilizer. In one study there was an increase in organic matter which levels off after about 20 years.

## REDUCE LEACHING

Based on the preceding information, Petrovic recommended the following practices to reduce nitrate leaching:

1. Limit the total amount of nitrogen applied.  
"Make sure you're not over applying what you

need. This is even more important on sandy soils," he said.

2. Use slow-release nitrogen sources, or low rates of soluble nitrogen applied more often, where possible.
3. Be cautious during dormant or slow growth periods, when the grass is no longer growing but the ground is not yet frozen. Again, this is even more important on sandy soils.
4. Irrigate only to replace water used by the plant. "It doesn't help the plant at all to over-irrigate. "We have better equipment now to do a better job of putting on what the plant needs," Petrovic said.
5. Reduce nitrogen on older sites.
6. Collect drainage water - especially from greens and tees on golf courses - instead of allowing it to drain into the nearest stream or river.
7. Use zeolite amendments, especially in areas with sandy soils. "Zeolite is a mineral with a high cation exchange capacity that can hold on to things like potassium, calcium, phosphorus, magnesium or ammonium," Petrovic said. It can be used as an amendment with sand on golf course greens and tees, either during their construction, or as a surface application on existing sites.

## PESTICIDES

"Most pesticides today are organic compounds, so they break down to carbon dioxide and water. We don't find things like lead, mercury or copper in pesticides anymore," Petrovic said.

Factors that affect the leaching of pesticides include soil properties, environmental properties, and management practices. Uncontrollable factors, such as earth worm channels, also enhance the movement of pesticides through soil.

**Soil properties:** "Soils that have a low amount of organic matter or clay tend to have a higher leaching potential, which goes along with the fact

that they have higher saturated conductivities and lower moisture retention," Petrovic said. "So water moves through these soils more quickly and in greater volumes. And then the soil itself - because of the lack of organic matter or clay - won't be able to bind and/or microbially degrade pesticides," he said.

**Environmental properties:** Pesticides are more apt to leach with high precipitation and with lower temperatures, due to less microbial activity. "Hold off (pesticide applications) during heavy rain periods, especially when the weather is cooler and with very water soluble pesticides," Petrovic advised.

**Management practices:** "Normal turf management practices lead to few pesticide leaching problems," Petrovic said. However, better management practices can further reduce or eliminate leaching.

First, look at the chemical type, formulation and concentration. "We need to think more about the chemicals we're using," Petrovic said. For example, the more water soluble a chemical is, the more potential for leaching. A chemical that doesn't easily bind to organic matter poses more of a hazard for leaching. And, the longer the half-life of a chemical, the more its potential for leaching.

Unfortunately, this information is not on the label, and only water solubility is on the MSDS (material safety data sheet), according to Petrovic. However, half-life and binding properties generally can be found in the pesticide data base compiled by the USDA or the Soil Conservation Service, or by asking the manufacturer.

## **MORE HELP**

Other practices a turf manager can use to reduce the chances of pesticide leaching include: avoid over-irrigation; have proper drainage; and

develop a thatch layer. "Thatch is good from an environmental standpoint," Petrovic said. One study showed that 96 to 99 percent of detectible pesticide residues were found in the thatch, which ties up and breaks down the pesticides.

The condition of the turf also affects leaching. "Turf that's young and thin is more susceptible to leaching," Petrovic pointed out. "With a thick, dense turf, there's little leaching, even with sandy soils."

Finally, Petrovic reported on United States Golf Association-sponsored research at ten universities that looked at the leaching of four fertilizers and 20 different pesticides. The studies measured the percent of applied pesticide that was recovered in the leachate.

The first application of fenamiphos had the highest rate of leaching at 18 percent. However, for the second application, only two percent leached. "This phenomena is known as enhanced breakdown. With the second application, a group of bacteria are ready to break down the pesticide more quickly," Petrovic said.

With dicamba, five percent was recovered in the leachate. For all other pesticides, less than one percent was recovered in the leachate.

"I believe this study shows two things," Petrovic pointed out. "First, not all pesticides are the same. And second, even some pretty mobile pesticides may not leach under all conditions. You really have to look at three things - the soil, the pesticide and the climate - and how they interact," Petrovic said.

"We can take an extremely mobile pesticide and put it on a very mobile soil. But if water doesn't move through that soil, it's never going to leach. Or, if a lot of water is moving through, there's a higher potential for leaching," he concluded.

## **DISEASE UPDATES**

**Ethel M. Dutky, University of Maryland  
Anne Bird Sindermann, MD Dept. of Ag.**

*Editor's Note: The following is a report from a gathering of plant pathologists sharing information on diseases of ornamental plants.*

### **Powdery Mildew on Rhododendron**

Dr. Jay Pscheidt from Oregon State University reported a new powdery mildew seen on Rhododendron. The symptoms are easy to miss because the white mildew is on the lower leaf surface and is often rather inconspicuous. Look for yellow spots, blotches or patches on the leaves. Purple spots and blotches may also be seen, then the areas can turn brown, and leaves can be distorted in shape. If you look closely on the lower leaf surface beneath discolored areas, the fungal growth can be seen as a faint patch of mildew. In the fall an overwintering stage of the fungus, the perfect stage, is produced, and can be seen as small, black specks on the mildewed areas.

### **More on Powdery Mildew**

Pathologists from several east coast states noticed an increase in powdery mildew on landscape and nursery flowering dogwood. Bob Mulrooney (Delaware) mentioned that he has seen powdery mildew on various *Cornus sericea* cultivars, especially 'Silver and Gold' and also on *C. florida* in arboreta and landscapes..

### **Research on Root Rot Control**

Aluminum sulfate and lime used as soil amendments may also provide impressive control of root rot disease caused by *Phytophthora* and *Pythium*. Dr. Mike Benson from North Carolina presented some data that indicates that the aluminum ion apparently inhibits essential fungal enzymes and provides control comparable to that

of commercial fungicides. Dr. Benson has studied the idea using 'Little Bright Eyes' vinca but the technique may be useful for woody ornamentals as well.

### **Downy Mildew of Rose**

Downy mildew of rose is rarely seen in Maryland, though in 1992 it was a problem. Symptoms include red to purple leaf spots, malformed leaves, defoliation and death of plants. Plants with symptoms are unsalable. The disease has caused large losses in Texas and Tennessee. Roses bought as bare root stock, potted up and forced into flower for early spring sale were badly damaged. Most growers don't spray roses produced in this fashion. In 1992 Texas growers had very large losses from downy mildew, with the disease showing up in some blocks, then rapidly spreading throughout the crop and then to hold over plants.

In addition to rose, *Peronospora sparsa*, the cause of downy mildew of rose, can infect various brambles. The fungus cannot be grown in lab culture but is readily identified from spores produced on infected leaves. Ironically even though it cannot be cultured for diagnostic purposes it will persist in bramble tissue culture production systems. It has been noticed that the Neogen alert on-site test kit for *Phytophthora* also reacts with the rose downy mildew fungus. This may be helpful in screening stock plants.

### **Seiridium Canker on Leyland Cypress**

The Crossnore gathering had a lively discussion about Seiridium canker on Leyland cypress. This disease is characterized by "bleeding" twig and trunk cankers that may progress to twig blight. It can be diagnosed by microscopic examination of the cankers to find the coal black acervuli (fungal fruiting structures) erupting through the bark. It is easily confused with Botryosphaeria canker.

### **Neem Guard - a New Botanical**

Dr. Jim Locke with the USDA in Beltsville reported that progress is being made in registration of neem oils and waxes to be sold as Neem Guard. The product controls a variety of foliar diseases including powdery mildews. This botanical product is derived from neem seeds, and is part of what is left over after the insecticide azadirachtin is extracted from the seed. The product will be labelled as a fungicide-insecticide-miticicide, as it provides some control for all of these pests. It should have a very broad label for non-food crops.

### **The Washington Elm**

Though many say that little good comes out of Washington, DC these days the Washington elm is truly a tree with excellent potential. It will be available as a vegetatively propagated elm with good resistance to Dutch elm disease. Dr. Jim Sherald with the National Park Service in Washington, DC explains that it was found in a planting of American elms growing in the Washington Mall in Washington, DC. It stood out for several reasons. It leafed out earlier in the spring, produced much less seed, and stayed green for weeks later in the fall compared to nearby American elms. In growth habit it looks like an American elm with the attractive vase shape and good, strong V-shaped crotches.

It turns out that the tree is a triploid, probably with American elm as one parent and some other elm as the other parent. When its seed is germinated, it produces very weird looking plants, and a lot of seed does not germinate. This is another advantage for a landscape elm, as you know if you have ever cleaned elm seeds and seedlings out of gutters and downspouts. We hope that this tree will be available to nurseries soon.

Reprinted from *Free State Nursery News*,  
November 1994.

## **THE LOWDOWN ON LANDSCAPE FABRIC - DO THEY WORK?**

**K. Marc Tefteau, Regional Specialist  
University of Maryland**

A major component of landscape maintenance programs is the suppression or elimination of weed growth. Weeds compete with desired plants for space, water, nutrients and light as well as detract from the aesthetics of the site. Traditional methods of weed control include hand pulling and herbicide applications.

In an attempt to reduce hand weeding costs and to move away from chemical use in the landscape a recent alternative has been the use of landscape fabrics (also known as geotextiles or weed barriers).

### **General Conclusions about the Use of Landscape Fabrics**

Research by Drs. Appleton, Derr and Tefteau has resulted in the following conclusions. The use of landscape fabrics is not a cure-all for weed control problems in the landscape. Each site must be evaluated on its individual merits. If landscape fabrics are to be used, a mulch of some type, either organic or inorganic should be included in the installation.

Black and clear plastics have no place in the permanent landscape. They interfere with moisture and gas exchange in the soil, can cause root rot problems on heavy soils, and are slick - resulting in poor mulch retention.

All fabrics are not created equal. They vary as to porosity, strength, photo-degradability, cost and ease of installation and removal. Weed control effectiveness with landscape fabrics can differ depending on the fabric type, the type of mulch

used and the major weed species present. Fabrics give poor control of tough perennial weeds such as yellow nutsedge and Bermuda grass (wire grass).

Shrub and tree root surfacing and rooting into the fabric can occur depending on the species in question and the fabric used. In some situations, vole problems in the site can increase because favorable habitats are formed by the landscape fabric.

Differences in soil moisture and temperature are not significant between fabric types (except for black plastic). Mulch use - organic vs. inorganic - has more effect on soil moisture and temperature than geotextile type.

To prevent weeds growing into the fabric, organic mulch layers must be kept shallow ( 1 to 2 inches), but depth will vary depending on type of mulch used. Four to six inches of mulch will negate the benefit of the fabric and provide a good growing medium for weeds.

**Recommendations:** When deciding whether to use landscape fabrics or geotextiles, consider:

1. Permanency of the landscape
2. Specific weed control problems
3. Plant species in the planting
4. Installation and maintenance costs
5. Aesthetics of the site in question

If fabrics are chosen, consider the following for the greatest success in use of the fabric:

1. Use fabrics with a high % of closed space.
2. Use shallow layers of finer organic mulches.
3. Use inorganic mulches in place of organics.
4. Keep the fabrics evenly covered at all times.
5. Remove any mulch-layer weeds while small.
6. Consider applying a pre-emergent herbicide.
7. Don't pull up the fabric around trees and shrubs.

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## **REDUCING WATER AND NUTRIENT RUNOFF FROM NURSERIES**

**David S. Ross, Extension Agricultural Engineer, University of Maryland**  
**Stanton A. Gill, Regional Nursery and Greenhouse Specialist, University of Maryland.**

The states of Maryland, Pennsylvania, and Delaware are involved in a major effort to reduce contaminants from farms and residential areas by 40 percent by the year 2000. Greenhouses and nurseries must evaluate their operations and make changes so that phosphorus and nitrates are not running off into streams or groundwater.

Current irrigation and fertilization practices are the source of runoff. Therefore, improvement in the use of water and nutrients should reduce the problem.

Existing irrigation practices are frequently less efficient than they could be with current technology. Runoff occurs because irrigation systems run too long or water falls on bare ground or plastic and runs off. When the irrigation water contains a liquid feed of nutrients, then excess nutrients may be applied or the nutrients are not directed to the growing media of the plants. Better control of irrigation systems can be obtained using time clocks (controllers) and electric solenoid valves. Nutrients may be better controlled by applying them as slow release fertilizers or as a side dressing. Liquid feed at a low application rate can also be used, particularly when the watering time is controlled to limit leaching to 10 percent.

### **Current Water Application Practices**

Overhead sprinkler irrigation is a common method of applying water. The more uniform the application, the more efficient the system can be. Water is generally applied to the walkways and to the bench where there are no plants. Plant foliage

deflects water away from the container in which the plant is growing.

Hand watering allows the applicator to better target his crop but hand watering is a time-consuming method. It can also be wasteful because water may be applied faster than it can infiltrate, and much water is deflected by foliage or falls to the floor while the applicator is moving around.

### **Improved Water Application Practices**

The goal is to get as much of the water to the plant as possible. Many crops are watered by some type of trickle irrigation system. Individual emitters are placed into containers to apply water at a slow rate. When properly controlled, the container is watered to the point where 10 percent or less leaching is allowed to occur.

In addition to simply controlling water application with time clocks and solenoid valves, a controller can "pulse" or apply water several times a day, if necessary to supply water without leaching. Some soilless mixes are so well drained that it is easy to overapply water and have leaching. The media may not hold enough water for even one watering per day.

Containers can be set into trays that catch excess water and hold much of it for the container media to absorb back when needed. This method also extends the time between watering. This method can be called "constant flood."

In addition to the trays, at least one grower is covering a bench with a liner of thick plastic film to make a tray. The bench is flooded to a half-inch depth, and the plants gradually use up the water. The bench should be perfectly flat for best results.

Another subirrigation method is the capillary mat system. Generally small containers with good

wicking characteristics are placed on a porous media through which water flows by capillary action. A trickle emitter system may be used to apply the water on the bench. The water spreads out to all the surface of the bench. Plants are watered by the capillary movement of the water through the soil media.

A last irrigation method to mention is the ebb and flood system. A special bench surface is needed to contain and spread the water quickly. Also, a tank and pump system is needed to move the water. The bench usually has drainage groves in the bench so the water drains quickly. In a normal irrigation cycle the water in the tank is pumped up onto the bench surface to "flood" the containers.

### **Water Recovery and Recycling**

Many improved watering methods reduce the water application by better timing of the irrigation cycle or by containing the irrigation water on the tray or bench. The ebb and flood irrigation method introduces recycling of water. Captured water can be monitored for nutrient level and treated for diseases. Nutrients and a disinfectant such as chlorine or bromine can be added as appropriate.

Rain water can be captured from the roof and plastic covered ground beds during wet weather.

### **Improved Nutrient Application Methods**

Nutrients can be applied in many ways. Recent studies at Michigan State University using 6-inch poinsettias, showed similar media nutrient levels were maintained with 200 ppm N and 12% leaching as with 400 ppm N applied with 50% leaching. The amount of nitrogen runoff is 40 times greater with the latter practice.

Unfortunately, excessive leaching is all too common with the very porous media that are used today.

Slow release fertilizers such as osmocote, magamp, sulfur coated urea or nutricote can be incorporated into the soil before planting or applied directly to the soil surface in the pot. By doing so, plants can receive a constant supply of nutrients over the course of the growing season. Since nutrients are not released all at once, there is less loss of soluble materials through leaching and runoff. Slow release fertilizers are formulated to last specific amounts of time which can save on labor costs since additional applications are unnecessary or infrequent. However, these time limits can be altered depending on the temperature and whether certain bacteria are present. Also, heavy rains can leach out large amounts of the fertilizer.

One of the disadvantages to the use of slow release fertilizers is the loss of control over soluble salt levels. If soluble salt levels go too high during periods of slow growth, there really is no effective way to adjust the fertilizer to bring down these levels. Another problem is that if the fertilizer is subjected to poor release conditions until near the end of the production cycle, the plants can be over fertilized when finishing off the crop.

One way to optimize the use of slow release and soluble fertilizers is to use them in combination. Both can be applied at a lower rate. A grower can adjust nutrient levels weekly using a soluble fertilizer to supplement the slow release. A consistent and adequate supply of nutrients to support plant growth can be applied this way.

In summary, both water and nutrients need to be managed so they do not run off into the outside environment. Controlled use, containment and recycling can all help to prevent contamination of the environment.

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**IMPROVE SUMMER SALES**  
**Susan Barton, University of Delaware**

*The following is a summary of a talk presented by Sig Fiele from Atlantic Nursery at the 1995 Long Island Nursery Conference.*

Improve summer sales by creating high-color display gardens that feature summer-blooming plants. Make sure plants featured in the display are available for sale in the store. Use summer-blooming vines on posts, arbors and trellises to create demand for underutilized plants. Create temporary displays each weekend featuring new plants and plant combinations at their peak.

Attract attention to summer-blooming plants with add-on signs. Use add-on signs to denote plants that attract butterflies such as buddlea. Emphasize fragrant plants for patio planting with special displays and signs.

Feature a "perennial-of-the-week" each week throughout the summer. Use larger "example-plants" to show how established perennials will look in the garden.

Grow a summer crop of vegetables in larger containers for customers who got a late start on their vegetable gardens. Look for other merchandise, such as flags to sell during the summer months.

Avoid fourth of July sales. They tell customers that the season is over by early July. That sends the wrong message to potential summer gardeners. If you implement some of these suggestions your selling season can stretch through the summer months.

## PESTICIDE NEWS

### Insecticides:

OTTO (acephate) - Valent U.S.A. Corp. - is the company's name for their new Orthene Turf, Tree & Ornamental spray insecticide in water-soluble packs. It is labeled to protect 110 types of plant from a total of 45 types of insect pests with systemic control.

TAME 2.4EC (fenpropathrin) - Valent U.S.A. Corp. - has expanded its label to include outdoor containerized ornamentals in all states except California & New York. It is labeled for use on plants such as *Buxus*, *Cotoneaster*, *Euonymus*, *Rhododendron* and *Rosa*. The product is designed to control a broad spectrum of insects.

PINPOINT - Valent U.S.A. Corp. - a new granular insecticide, is now available for container and field-grown ornamentals.

AZATIN EC (azaderachtin) - Agri Dyne - has added to their label the control of black vine weevil on nursery plants.

ESC1-M1-F4 (*Metarhizium anisopliae* var. *anisopliae* strain ESC1) - Eco Science. This biopesticide is being tested on an experimental basis to control whiteflies and aphids on greenhouse grown ornamentals.

DURSBAN PRO - DowElanco - is a new insecticide to control chinchbugs and cutworms among others. Designed for turf and ornamentals, it replaces Dursban 2E, Dursban 4E and Dursban Turf Insecticide.

EXHIBIT - Ciba-Geigy Corp. Discontinued sale of biological larvicide effective Nov. 30, 1994. Ciba had sold Exhibit through a marketing agreement with Biosys Inc.

MERIT INSECTICIDE (imidacloprid) - Miles Inc. - is a newly-registered product for use on turf/ornamentals and is available in a .5 percent granular formulation. It delivers season-long control of many turf and ornamental insects.

METASYSTOX-R-2 - Gowen Co. The product will be offered for ornamental pest control. However, as the label currently stands, it may not be used on commercial production nurseries. Gowen says it is working with EPA to add a Worker Protection Standard amendment to the product's label.

INJECT-A-CIDE AV (abamectin) - J.J. Mauget Co - insecticide is now available for control of a variety of insects. The product is used as part of an injection system to provide control of leafminers, elm leaf beetles, sycamore lace bugs and fall webworms on trees over 2 inches in diameter. It is also labeled for spider mite control on most ornamental trees, with the exception of conifers.

VECTOR MC (*Sternernema rio bravis*), VECTOR WG (*Sternernema glaser*) - Biosys is marketed to golf courses and lawn care industry to control mole crickets in turf.

### Fungicides:

'Mycostop Biofungicide for Ornamentals' and 'Mycostop Biofungicide for Vegetables' have been combined into one product and label for 1995. The new product and label is 'Mycostop Biofungicide for Vegetable and Ornamental Crops.'

BSP LIME-SULFUR SOLUTION - Best Sulfur Products. The U.S. and California Environmental Protection agencies have approved its use on a wide range of deciduous hedge plants, ornamental shrubbery, shade trees and berries for control of scale, anthracnose, black spot, powdery mildew and rust.

DACONIL ULTREX (chlorothalonil) - ISK Biosciences - is now available in a spray dry-granule (SDG) formulation. The product is labeled for a broad range of ornamentals.

DOMAIN (thiophanate-methyl) - Scotts Co. - is now available in water-soluble bags.

TRIFORINE - Valent USA Corp - is a local systemic fungicide and is once again available for use on nursery and greenhouse stock.

TERRACLOR - PCNB, Uniroyal - will have chemigation added to the label of the 75WP and 400 formulations for this product.

#### **Herbicides:**

PENDULUM WDG (pendimethalin) - American Cyanamid Co. - has expanded its label, bringing the species total to 260. The product is designed for over-the-top application on ornamentals for up to eight months of weed control.

FACTOR - Sandox Agro Inc. - is a new herbicide labeled for use on container and field-grown ornamentals for grass and annual broadleaf control.

TRIMEC S.I. (2,4D, MCPP and dicamba) - PBI/Gordon Corp. - is designed for use on sod farms and industrial turf sites. Its label language includes worker protection provisions required by the EPA to permit its use by sod producers.

STRIKE 3 - Terra International, Inc. - controls a variety of weeds such as chicory, chickweed, clover, dandelion, ground ivy, henbit, lambsquarters, morning-glory, pigweed, poison ivy, poison oak, ragweed, and spurge in ornamental lawns and turf. Now available in 2.5 gallon jugs.

RONSTAR 50WP (oxadiazon) - Rhone-Poulenc Ag Co. - has deleted use on blue spruce (*Picea pungens*) from its label.

RONSTAR 50W (oxadiazon) - Rhone-Poulenc Ag Co. - is a new formulation of the herbicide. Packaged in water-soluble bags, the product is expected to be available in spring 1995.

RIVERSIDE TRIFLURALIN 4EC - Terra International Inc. - has received EPA approval for use on ornamentals. It is designed to provide long-lasting control of a variety of annual and broadleaf weeds by killing their seeds as they germinate.

ENDURANCE (prodiamine) - Sandoz - is a new formulation recently introduced for weed control on roadsides, parking and storage areas, landscape ornamentals, perennials and wild flower plantings, and conifer and hardwood seedling nurseries.

#### **Other:**

FLOREL FRUIT ELIMINATOR - Monterey Lawn & Garden Products - This product reduces or eliminates undesirable fruit development on many ornamental trees and shrubs such as: apples, carobs, cottonwood, crabapples, elm, flowering pear, horse chestnut, maples, oaks, olives, pines, sour oranges, sweetgum and sycamore. It is available in pints, quarts, gallons and 2x2 1/2 gallon containers.

MOLE-MED - DuPont - is a mole repellent containing the new active ingredient castor oil at 66%. The registration is o.k. for one year, then EPA will look at it again.

**Other:**

Worker Protection Standards:

The EPA is proposing several rule changes.

1. Training - Reduce the current “15 day” grace period for new employee training and decrease retraining period from every 5 to every 3 years.
2. Irrigation Exception - A proposal for low contact irrigation tasks would allow a maximum of 8 hrs in treated areas every 24 hours except for double warning pesticides.
3. Shorter Restricted Entry Intervals - Shorten the REI for 90 low toxicity pesticides from 12 to 4 hours.
4. Crop Advisors - Exempt from most requirements of WPS.
5. Limited Contact Exception - The EPA is trying to define a list of limited contact tasks that could be performed during REIs for up to 3 hours per day.

Materials for WPS:

| <u>Materials</u>                                | <u>Sources</u> |
|---|----------------|
| How to Comply Manual                            | 1, 2, 3, 5     |
| <i>What employees need to know</i>              |                |
| Flip Charts                                     | 2, 3           |
| <i>For training agricultural workers</i>        |                |
| Training Notebooks                              | 1, 2, 5        |
| <i>For employers</i>                            |                |
| Pesticide Safety Training Video                 | 2,             |
|   | 3, 4           |
| <i>For training both handlers &amp; workers</i> |                |
| Safety Training Video for Pesticide Handlers    | 8              |
| Guide for Agricultural Workers                  | 1,             |
|   | 2, 3           |
| Handler Handbook                                | 1,2            |
| <i>Guide for agricultural handlers</i>          |                |

|  |      |
|--|------|
| Pesticide Safety Poster                        | 2, 5 |
| <i>For central posting</i>                     |      |
| Pesticide Application List                     | 2    |
| <i>For central posting</i>                     |      |
| Field Warning Sign                             | 2    |
| <i>For field notification</i>                  |      |
| Chasing the Sun (video)                        | 7    |
| <i>English/Spanish worker trainging</i>        |      |
| Always Wear the Right Stuff (video)            | 6    |
| The Greenhouse Pesticide Safety Training Video | 9    |

Sources:

1. Government Printing Office  
Superintendent of Documents  
PO Box 371954  
Pittsburgh, PA 15250-1774  
202-783-3238
2. Gempler’s PO Box 270  
Blue Mounds Rd.  
Mt. Horeb, WI 52572  
800-382-8473  
800-551-1128 (FAX)
3. Publications, IFAS Bldg. 664  
PO Box 11011  
University of Florida  
Gainesville, FL 32611  
800-226-1764  
904-392-2628 (FAX)
4. Ag Communication Ctr.  
Univ. of Idaho, Rm 10  
Ag. Science Bldg.  
Moscow, ID 83844-2332  
208-885-6436
5. Cornell Cooperative Extension  
246 Griffing Avenue  
Riverhead, NY 11901  
516-727-7850
6. Media Services Resource Center

Cornell University  
7 Business & Technology Park  
Ithaca, NY 14850  
607-255-9946

7. National Migrant Resource Program, Inc.  
1515 Capital of Texas Hwy. S., Ste. 220  
Austin, TX 78746  
512-328-7682
8. MSU Distribution Center  
Attn: Katie  
103 Central Services Bldg.  
East landing MI 48824-1001  
517-353-6740
9. Professional Plant Growers Assn.  
PO Box 27517  
Lansing, MI 48909  
800-647-7742

Federal Pesticide Record Keeping Regulations:

USDA has finalized amendments to the Federal Pesticide Record Keeping Regulations, effective May 11.

1. Certified private applicators now have 14 days (changed from 30) in which to make a record of the application of a restricted use pesticide.
2. Record information provided to the attending licensed health care professional will now also be available to individuals acting under the direction of that professional for purposes of treating those who may have been exposed to a restricted use pesticide.

## LEGISLATIVE UPDATES

### Open burning -

*Information provided by John Apgar from Delaware Council of Farm Organizations.*

The following prohibitions apply to all counties:

No open burning of refuse, in the conduct of a salvage operation or of fallen leaves.

Kent and Sussex prohibitions:

No open burning from June 1 through August 31.

Restrictions:

Open burning is allowed for

- branches and limbs cut from trees on premises by people residing on premises.
- clearing of agricultural land for crops or livestock.
- conservation practices, wildlife habitat management, or plant, pest or disease control (with prior approval).
- wooden building for firefighting instruction (with prior approval).

Individuals must give prior notice to the Fire Call Board for the county.

No burning allowed when condition of air stagnation exists, national ambient air quality standard may be violated or when open burning causes unreasonable interference with health or property.

Fires must be terminated if notified, under supervision at all times, made with only the minimum amount of auxiliary fuel. Open burning must occur between 10 AM and 4 PM unless approved by the Department.

## RESEARCH BRIEFS

### Minimum wage -

Senate Bill No. 24 has been passed in the Senate. This bill raises the minimum wage rate to at least \$5.00 an hour. The bill is now in the House.

House Amendment No. 1 allows an employer to pay less than the minimum wage for up to 6 months to a person under the age of 18 who has no prior compensated work experience. After a training period of up to 6 months, the employer should know if the young employee has the ability to continue employment. This Amendment gives a young person, inexperienced in the work force, the opportunity to prove his or her ability to be a productive employee and gives an employer incentive to hire inexperienced youngsters seeking first-time employment.

House Amendment No. 2 serves to phase in the minimum wage rate increase over a two year period by establishing the rate of \$4.65 at the time of enactment and \$5.00 effective January 1, 1997, and makes a technical correction to the bill.

### Propagation:

#### **Germination of Purple Coneflower.**

Evaluations of commercial seed lots of purple coneflower (*Echinacea purpurea*) resulted in germination percentage variation from 91% to 39% depending upon seed lot. Light did not affect germination but alternating temperatures improved germination in one of the low-germinating seed lots. Seed harvested at maturity, but before drying, had a higher germination percentage than seed harvested after desiccation. Those seed maintained a higher germination percentage even after one year of storage. (N. Wartideningsih and R. L. Geneve)

Osmotic priming (for 4 days) at 25 C in salts (KNO<sub>3</sub> + K<sub>3</sub>PO<sub>4</sub>) or polyethylene glycol 4000 increased early germination percentage of all seed lots and improved total germination percentage of low-germinating seed lots. Chilling stratification in water at 10 C increased early and total germination. (N. Wartideningsih, R. L. Geneve and S.T. Kester)

#### **'Yoshino' Cryptomeria Cutting Propagation.**

'Yoshino' Cryptomeria stem cuttings can be rooted at all growth stages (softwood, semi-hardwood, hardwood and prebud break) using the tips of and the proximal halves of first-order laterals containing lignified, hardened wood. IBA treatments (3000 mg IBA/liter) increased rooting except with softwood cuttings. (L.G. Jull, S.L. Warren and F.A. Blazich)

(Previous three articles excerpted from *HortScience*, Vol 29(12), December 1994.)

**Growth Regulator on Callery Pear.** Foliar sprays of Promalin at 750 or 1500 ppm ai in June significantly increased branching of *Pyrus calleryana* cultivars resulting in a more desirable small landscape tree. Promalin was more

effective than Atrimmec (dikegulac-sodium). (T. Jacyna, C.J. Starbuck and M.R. Ellersiek)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(2), March 1994.)

#### **Softwood Cuttings of *Maackia amurensis*.**

*Maackia amurensis* can be rooted by taking softwood cuttings either when terminal shoots are fully expanded and have just begun to stiffen or 5 weeks later. Treatment with K-IBA increased rooting success nominally. Successful asexual propagation could increase the nursery production of this obscure but desirable landscape tree. (S. McNamara, W.R. Graves and H. Pellet)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

#### **Seed Source Influence on Growth of Seedlings.**

Sycamore and sweetgum seedlings from selected forest tree improvement seed were compared to seedlings from conventional seed sources. Seedlings from select half-sib families of sycamore have 11-14% greater growth in height and an 11% increase in caliper. These seedlings resumed limited height and caliper growth in the year following transplanting while seedlings from the local source did not. Less pruning cuts were required to remove multiple leaders and large basal suckers on selected sycamore and sweet gum seedlings during production. (M.A. Arnold and W.E. Davis)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(4), December 1994.)

#### **Field Production:**

**Row Covers.** Row covers are used to protect the soil, conserve moisture and reduce weeds. Clover reduced plant growth for non-irrigated crape myrtle and irrigated or non-irrigated

redbud. Pine bark did not affect growth. It may prevent soil erosion, prevent water loss due to evaporation and reduce the need for chemical weed control. However, pinebark mulch may be cost prohibitive. (S.E. Newman and L.P. Baldrige)

#### **Deep Tillage and Tree Shelters for Field**

**Establishment.** Deep tillage and tree shelters improved survival and growth of bare root white oak during the first year of establishment. Benefits of tree shelters were probably due to reduced animal depredation. These techniques might be useful for large scale revegetation effort or for establishment of bare root liners by field nurseries. (R. Kjelgren, B. Cleveland and M. Foutch)

**In-ground Fabric Containers.** Even when irrigated, trees (crabapples) produced in field nurseries with in-ground fabric containers grew less than those conventionally produced without fabric containers. In-ground fabric container production may require more frequent irrigation (> 2 gal/day) for success. (R. Kjelgren, C. Spihlman and B.R. Cleveland)

(Previous three articles excerpted from *Journal of Environ. Hort.*, 12(2), March 1994.)

**Handling of Bare-root Stock.** While protection of roots of all bare-root stock reduces water loss, sensitive species such as Washington hawthorn require both root and shoot protection to minimize water loss. (R.M. Bates, A.X. Niemiera and J.R. Seiler)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(4), December 1994.)

#### **Container Production:**

**Cyclic Irrigation For Containers.** Container growers can grow 'Compacta' holly with less water by applying irrigation in 2 or 3 cycles vs.

continuous irrigation. Container leachate volume is also reduced, which results in less NO<sub>3</sub>-N leached than in traditional continuous irrigation. (D.C. Fare, C.H. Gilliam, G.J. Keever and J.W. Olive)

(Previous article excerpted from *HortScience*, Vol 29(12), December 1994.)

#### **Growth Regulators on ‘China Girl’ Holly.**

Container-grown ‘China Girl’ Holly requires frequent pruning to maintain a compact growth habit. A single foliar application of 500 ppm, 0.14 oz Cutless 50 WP/gal (flurprimidol) suppressed growth during the season of application but not thereafter. Higher rates of Cutless (1500-2500) resulted in growth inhibition that lasted for at least two growing seasons. (G.J. Keever, C.H. Gilliam and D.J. Eakes)

#### **Growth Regulators on ‘Roseum Elegans’**

**Rhododendron.** Root zone drenches of Bonzi (paclobutrazol) in the range of 10-20 ppm, resulted in more compact plants with greater numbers of flower buds than foliage-treated or control container-grown ‘Roseum Elegans’ Rhododendron. (T.G. Ranney, R.E. Bir, J.L. Conner and E.P. Whitman II)

(Previous two articles excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

#### **Analysis of Second Slow-release Fertilizer**

**Application in a Season.** Low levels of substrate-N and electrical conductivity during the latter half of the growing season may be suboptimal. When deciding whether to apply another controlled release fertilizer application, growers must consider whether the added growth will result in greater economic gain and whether the application will result in significantly higher N-loss through runoff. In this study with ‘Helleri’ holly, a growth increase of 2 inches in width was not sufficient to bump the plant up to the next highest size category and the N leached

from containers increased by as much as 42%. (M.C. Shiflett, A.X. Niemiera and C.E. Leda)

#### **Scheduling Irrigation of Container Plants.**

The most efficient way to water container plants is to apply low volumes of water to dry media (low pre-irrigation substrate water content, PSWC). By scheduling irrigation based on PSWC and controlling application volume water application efficiency can approach 100%, thereby reducing water and nutrient leaching from container production. (N.S. Karam, A.X. Niemiera and C.E. Leda)

#### **Fertilization of *Cryptomeria japonica* ‘Elegans**

**Aurea.’** Root and top growth of *Cryptomeria japonica* ‘Elegans Aurea’ were maximized at a relatively low rate of nitrogen (25 mg/l). Higher rates of N could potentially produce a lower quality plant by decreasing total root length and root area. In addition, since the cultivar did not absorb more N as the external N rate increased, this additional N could be lost by leaching, contributing to environmental pollution. (L.G. Jull, S.L. Warren and E.A. Blazich)

(Previous three articles excerpted from *Journal of Environ. Hort.*, 12(4), December 1994.)

#### **Greenhouse Production:**

##### **Growth Regulation of Seed Geraniums.**

Of the growth regulators tested, only clormequat (Cycocel) or low rates (3.5 ppm) of paclobutrazol (Bonzi) provide growth regulation of seed geraniums in the greenhouse while permitting unchecked growth in the landscape. (J.G. Latimer and S.A. Baden)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

##### **Biological Control of Sweetpotato Whitefly on**

**Poinsettia.** A 2-year demonstration study was conducted to compare the effectiveness of two

sources of *Encarsia formosa* (EF) on the biological control of the sweetpotato whitefly (SPWF) on poinsettias. Commercially produced EF raised on the greenhouse whitefly (GHWF) and locally produced EF raised on the SPWF were both able to reduce SPWF populations significantly. Maximum nymph parasitism ranged from 60% to >80%. This study suggests that there is potential for controlling SPWF populations on poinsettia by EF in conjunction with an integrated pest management (IPM) program. (R.W. McMahon, R.K. Lindquist, B.D. Baith, T.L. Makin and M.L. Casey)

**A Brushing Apparatus for Height Control of Bedding Plants.** Height control for vegetable transplants has become challenging with the loss of the industry standard growth regulator, daminozide (Alar). One alternative to growth regulators--brushing--was conducted on two tomato cultivars. Five weeks of brushing twice daily resulted in height suppression for both tomato cultivars. Brushing treatments were performed successfully by use of a grower-designed apparatus constructed from readily available materials.

(Previous two articles excerpted from *HortTechnology* 4(3), July/September 1994.)

#### **Weed Control:**

**Impact of Broadleaf Weed Herbicide on Crabgrass Control With Fenoxypop.** The efficiency of fenoxypop for smooth crabgrass control decreased significantly when used in combination with a broadleaf weed herbicide (2,4-D, mecoprop and dicamba). Control was unaffected when the broadleaf weed herbicide was applied 21 days before or 3 or more days after fenoxypop.

(Previous article excerpted from *HortScience*, Vol 29(12), December 1994.)

**Weed Control in Bulbs.** Allium, daffodil, star-of-Bethlehem, Canna, Crocosmia, daylily, German iris, Asiatic hybrid lily and peony were tolerant of the following pre-emergent herbicides applied at recommended rates, 3-5 times over 2-3 years.

Dacthal (DCPA)  
Gallery (isoxaben)  
Pennant (metalochlor)  
PRE-M (pendimethalin)  
Stakeout (dithiopyr)  
Derby (metalochlor + simazine)  
Snapshot (isoxben + oryzalin)

All herbicides controlled large crabgrass, horseweed and spurge, except Gallery at low rates (crabgrass and spurge control was poor). Also horseweed and spurge control was poor with Dacthal. All other herbicides tested worked better at lower rates than Dacthal. (W.A. Skroch, C.J. Catanzaro, A.A. DeHertogh and L.B. Gallitano)

**Crabgrass Postemergent Control.** Drive (quinclorac) is a post emergent herbicide that effectively controlled crabgrass in tall fescue with one application (.75 lb/A) on June 11 in Griffin, GA. Tall fescue suffered 35% injury but recovered within one week. No benefit was achieved by earlier (April 12 or May 3) or multiple applications. (MSMA requires multiple applications). (B.J. Johnson)

(Previous 2 articles excerpted from *Journal of Environ. Hort.*, 12(2), March 1994.)

**Over-the-Top Weed Control.** Pursuit (imazethapyr) at 4 and 8 oz/A, Cadre (AC 263, 222) at 1 oz/A and Image (imazaquin) at 8 and 9 oz/A were applied to azalea, ageratum, green-lvd begonia, bronze-lvd begonia, celosia, geranium, shore juniper, liriopse, French marigold, African marigold, petunia, photinia, red salvia, purple salvia and vinca. All herbicides resulted in good purple and yellow nutsedge control including

tuber regrowth but only French marigold and lirioppe were uninjured. Therefore, over-the-top applications of these herbicides is not feasible for most landscape plants. Directed spray applications may work.

Manage (MON 12037, proposed name is halosulfuron) at 0.13 and 0.26 oz/A provided good yellow and purple nutsedge control with little regrowth. A wide range of herbaceous and woody plants were tolerant of both rate. Greater than 10% injury, 4 weeks after treatment occurred on shore juniper, French marigold, red salvia, geranium and green-lyd begonia. (R.T. Hurt and W.K. Vencill)

(Previous two articles excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

**Granular Pesticide Application.** When applying granular pesticides to container-grown plants with a hand-cranked nursery spreader, the most important factors influencing uniformity were pattern slide setting, yaw angle and bed width. Cranking speed and pitch angle have less influence on pattern. Roll angle and impeller height had very little influence on pattern. (R.L. Parish)

**Weed Control in Field-grown Woody Ornamentals.** Several herbicides were tested in the following field-grown woody ornamentals: live oak, 'Mary Nell' holly, 'Chesapeake' viburnum and 'Acona' crepemyrtle. Predict (norflurazon) had superior sickle pod control. Slight to moderate injury occurred on crepemyrtle and viburnum but damage grew out by 90 days after treatment. Pendulum (pendimethalin) provided weed control similar to surflan and could be considered as an alternative in a rotation. Only goal (oxyfluorfin) controlled cutleaf evening primrose. (J.A. Reeder, C.H. Gilliam, G.R. Wehtje, D.B. South and G.J. Keever)

(Previous two articles excerpted from *Journal of Environ. Hort.*, 12(4), December 1994.)

### **Landscape:**

**Transplanting.** Transplanting studies with Kentucky coffee tree and silver maple suggest that balled and burlapped trees transplanted while dormant self-regulate their water loss by reducing the transpiring leaf area the following growing season. This supports the current recommendation that no pruning is needed at transplanting. (R. Kjelgren and B. Cleveland)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(2), March 1994.)

**Tree Stump Removal Products.** Three commercially available tree stump removal products: Dexol Stump Remover, Cooke Stump Remover + potassium nitrate and Lily/Miller Stump Remover + potassium nitrate as well as three N-containing fertilizers: KNO<sub>3</sub> (13-0-45), NH<sub>4</sub>NO<sub>3</sub> (34-0-0) and NH<sub>4</sub>SO<sub>4</sub> (21-0-0) were evaluated for their ability to hasten decomposition of stumps of two tree species (*Eucalyptus camaldulensis* and *Paulownia tomentosa*). None of the products accelerated decay. (G.W. Hickman and E. Perry)

**Root Growth.** Root growth of green ash, scarlet oak, Turkish hazelnut and tree lilac were studied. Shoots began growth first in Spring before root growth in all species except scarlet oak in which root and shoot growth began simultaneously. Root growth ceased in the fall at leaf drop. Therefore, fall transplanted plants should be moved before leaf drop to begin establishment in the fall. Without fall root growth, those plants must leaf out in the spring with reserves that exist in the transplanted root ball. (R. Harris, N.L. Bassuk and T.H. Whitlow)

(Previous two articles excerpted from *HortTechnology*, Vol 4 (No 4), Oct-Dec 1994.)

**Prunus Taxa Tolerance to Flooding.** ‘Newport Plum’ and ‘F-12/1’ Mazzard Cherry had the greatest flood tolerance and might serve as root stock for other less tolerant ornamental cherries. Carolina cherry laurel and ‘Canada Red’ chokecherry had the least flood tolerance. (T.G. Ranney)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

**Wildflower Establishment.** Wildflower establishment in four-inch deep seedbeds of equal volumes of co-composted municipal waste (CCMW) and an industrial byproduct (iron rich material, IRM) resulted in the greatest species diversity, most uniform population density and greatest seedling shoot dry weight as compared to soil, CCMW alone or IRM alone. The greater population density resulted in less vigorous wildflower and weed growth (due to competition) than was found in soil. (W.G. Pill, W.G. Smith, J.J. Frett and D. Devenney)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(4), December 1994.)

**Use of Ethepon Sprays to Eliminate Unwanted Fruit.** Fruit of flowering pear and sweet gum were eliminated by applying 1,000 ppm ethephon (Monterey Florel Brand Fruit Eliminator, Rhone-Poulenc Ag Co.) at full bloom. Fruit production was reduced by approximately 30% with lower rates (500 and 750 ppm) ethephon. Ethephon has recently been registered for eliminating flowering pear and sweet gum fruit. (E. Perry and A. Lagabro)

(Previous article excerpted from *California Agriculture*, March-April 1994.)

#### **New Releases:**

**Rhododendron ‘Northern Hi-Lights.’** *Rhododendron* ‘Northern Hi-Lights’ is a dense,

spreading deciduous azalea with creamy white flowers highlighted with a bright yellow blotch on the upper corolla. This cultivar is very hardy (zone 4a) and shows good powdery mildew resistance. Growers interested in producing this cultivar should contact: Don Selinger, Minnesota Nurserymen’s Research Corporation, 1325 Baily Rd., St. Paul, MN 55119. (N. Rose and H. Pellet)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

**‘George Vancouver’ Rose.** ‘George Vancouver’ is a winter hardy shrub rose with an upright growth habit and medium red flowers. The plant flowers repeatedly from June to September and is resistant to powdery mildew and black spot (in Canada, where it was tested). (I.S. Ogilvie and N.P. Arnold)

**‘Corbett’ Columbine (*Aquilegia canadensis*).** This columbine was selected from an isolated wild population for its height and habit, which are shorter and more compact than the species. ‘Corbett’ forms a dense mound (about 12“ tall and 12” across). Flowers are a pastel yellow as opposed to red flowers found on the species. This cultivar is available from Dunvegary Nursery (1002 S. New St., West Chester, PA 19382) and Holbrook Farm & Nursery (P.O. Box 368, Fletcher, NC 28732). (L.P. Perry)

**‘Starfire’ Cuphea Hybrid.** ‘Starfire’ has a less dense, more vigorous growth habit than its *C. ignea* parent. It is well-adapted as a potted plant and might be used as a hanging plant for greenhouse or household use. A limited number of cuttings can be obtained by writing to the North Central Regional Plant Introduction Station, Iowa State University, Ames, IA 50011; fax (515)292-6690. (A.E. Thompson, W.W. Roath, M.P. Widrlechner)

(Previous three articles excerpted from *HortScience*, Vol 30 (1), Feb. 1995.)

***Philadelphus leursii* 'Blizzard.'** Profuse flower production, cold hardiness (zone 2) and fragrance make this shrub valuable for gardens for the visually impaired. A limited supply of cuttings is available from Agriculture Canada Research Centre at Morden, 652 Aberdeen Ave., North Bay, Ontario PIB 749 Canada. (C.G. Davidson and J. Wallace)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(4), December 1994.)

#### **Interior Plants:**

**Pot-Within-a-Pot Containers.** Self-watering, pot-within-a-pot containers reduced media accumulation of soluble salts, increased root growth and enhanced foliar visual quality compared with a conventional self-watering (pot-in-saucer) method when tested with dracena and spathiphyllum. (C.A. Martin and S. Borgardt)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

#### **Marketing:**

##### **Why Customers Choose a Garden Center**

**Outlet.** Choice of garden center outlet depends first on the type of purchase. Consumer choose mass merchandisers for bedding plants for their competitive prices. Consumers choose garden centers for large trees, shrubs and unusual plants because they provide user-friendly information. Two additional reasons for choice of outlet are customer informational need and perceived quality of plants. Perceived quality can be enhanced by display. (E. Day)

(Previous article excerpted from *Journal of Environ. Hort.*, 12(3), June 1994.)

**City Tree Planting.** Residents of Sacramento, CA, who planted a yard tree as part of a community shade tree program were more satisfied with the outcome than residents of the

same neighborhood who had not been associated with the program. Satisfaction was lowest among those whose trees had been planted by a developer. Block plantings allowed neighbors to become better acquainted with one another. (R. Sommer, F. Learey, J. Summit and M. Tirrell.)

(Previous article excerpted from *Journal of Arboriculture* 20(6))

## WELCOME NEW MEMBERS

### Active Members

Blue Hen Lawn & Landscaping  
1700 Telegraph Road  
Wilmington, DE 19804  
(302) 999-9575  
Reps: Andrew Heinold

Carver's Lawn and Landscape  
811 Black Diamond Road  
Smyrna, DE 199777  
(302) 653-2928  
Reps: Rick Carver, Nancy Carver, Mike Farnan

Creative Landscaping  
93 Artis Drive  
Dover, DE 19904  
(302) 674-0526  
Reps: Jeffrey Bainbridge

Cosden-Evans Company  
601 W. Fulton Street  
Dover, DE 19901  
(302) 678-1021  
Reps: E.C. Lockwood, James Lockwood, Nancy Roberts

DCC, Ltd.  
6 Lamatan Road  
Newark, DE 19711-2316  
(302) 239-4739  
Reps: Emmett Conte

Lawnpro  
16 Maplewood Lane  
Wilmington, DE 19810  
(302) 475-0033  
Reps: Hilary Nortz, Meg Nortz

Nature's Touch Landscaping  
179 Haman Drive  
Dover, DE 19901  
(302) 678-0148  
Reps: Greg Kotzar

### Associate Members

Autumn Ridge Inc.  
PO Box 511  
Glencoe, MD 21152  
(410) 472-4265  
Reps: George Mayo

Richard Brusca Nursery  
140 Brusca Lane  
Sudlersville, MD 21668  
(410) 438-3180  
Reps: Richard Brusca, Monica Brusca

LESCO, Inc.  
667-B Dawson Drive  
Newark, DE 19713  
(302) 366-0131  
Reps: Al Sonchen, David Greenleaf

United Horticultural Supply  
312 W. Main Street  
Salisbury, MD 21801  
(410) 548-2200  
Reps: Jean Scott, Jeff Allison

**A Guide to Heat Stress in Agriculture.** Practical step-by-step guidance to managers on how to set up and operate a heat stress control program. Copies of guide available from U.S. Government Printing Office (doc. # 055-000-00474-9) by calling 202-512-1800. \$3.50 with 25% discount for orders of 100 or more GPO, Superintendent of Documents, Washington, DC 20402.

**Tips On Growing and Marketing Hanging Baskets.** Up-to-date information on the production and marketing of hanging baskets. The 88-page text contains 69 color figures, 29 tables, and black/white illustrations. Topics include growing environment, containers, media, irrigation and more. Available for \$23 + s/h. Contact the O.F.A. Services, Inc, 2130 Stella Court, Suite 200 Columbus, OH 43215-1033, Tel:(614)487-1117.

**The Role of Horticulture in Human Well-Being and Social Development.** The aim of this volume is to bring the reader a survey of Human Issues in Horticulture and to develop an overview of how plants affect people and explore diverse opportunities for research and acquisition of knowledge. ISBN-0-88192-209-0, a 254 pp volume with 8 color photos, published by Timber Press. Hardcover: \$50 + p/h. For more information contact Dr. Diane Relf, Dept. of Horticulture, Virginia Tech, Blacksburg, VA 24061-0327.

**The Healing Dimensions of People-Plant Relations; A Research Symposium.** This volume covers PPC conventions and research symposia held at the University of California, Davis, March 24-27, 1994. The 600-page printing of symposium papers includes topics such as The Impact of Community Gardening, Cultural Diversity in the Landscape Aging and Disabilities to name a few. Edited by Mark Francis, Patricia Lindsey, and Jay Stone Rice. Softcover: \$35 + s/h. For more information contact: Diane Relf, Dept. of Horticulture, Virginia Tech, Blacksburg, VA 24061-0327.

**Perennials for Outdoor Living.** Full color, 16 page descriptive text with over 90 color photos. Contains good consumer education and is an excellent sales tool. For price list and order form, Tel:(609)291-7070.

**Landscape Plants for New Jersey.** Full color, 36 pages descriptive text with over 210 color photos. This volume is an excellent sales tool offering good consumer education exclusive for New Jersey. For price list and order form Tel:(609)291-7070.

**Reducing Deer Damage to Home Gardens and Landscape Plantings.** This new Cooperative Extension publication discusses fencing, repellents, and deer feeding preferences among woody landscape plants as well as some general background information into the social aspects of deer management in upstate NY. By Paul D. Curtis and Milo E. Richmond, Dept. of Natural Resources, Cornell University. 22 pages, illustrated with line drawings, cost \$3.50. For more information contact Cornell University Resource Center, 8 BTP, Ithaca, NY 14850, or Fax: (607)255-9946.

**Home Lawns, Establishment and Maintenance.** Revised edition of "Home Lawns" bulletin. Full sized, comprehensive guide to planting and maintaining a lawn in NY State. Covers establishing a new lawn to special lawn problems, including the most common pests. Also useful for professionals who are charged with residential or public lawn care. A Cornell Cooperative Extension Publication by Mary C. Thurn, Norman W. Hummel and A. Martin Petrovic. I.B. 185, 46 pages, illustrated with line drawings, charts and graphs, price \$8.00. For more information contact Cornell University Resource Center, 8 BTP, Ithaca, NY, or Fax:(607)255-9946.

**Suppliers Of Beneficial Organisms In North America.** This new 30-page edition from the California Environmental Protection Agency Dept. of Pesticide Regulation Environmental Monitoring & Pest Management Branch contains a detailed list of 132 suppliers located in the USA, Mexico, and Canada, and the beneficial organisms that they sell. Many suppliers listed offer free catalogs and/or consultations. To obtain one free copy contact: The California Environmental Protection Agency Dept. of Pesticide Regulation Environmental Monitoring/Pest Mgmt. Branch, 1020 N. Street, Rm:161, Sacramento, CA 95814-5604, Tel:(916)324-4100.

**Bedding Plants IV: A Manual on the Culture of Bedding Plants as a Greenhouse Crop.** This reference book discusses everything from the history of bedding plants to the production, marketing, displaying and plant spacing once the plants reach the garden. This comprehensive book is full of tables/charts that are very informative. It discusses up-to-date information on merchandising, pricing, pest control, greenhouse structures and many, more important subjects. Edited by E.Jay Holcomb: Published by Ball Publishing, Batavia, Illinois, 335 N. River Street 60510.

**Compost Facility Operating Guide.** The 389-page, loose-leaf document provides 11 chapters on nearly all aspects of the composting process. The Alexandria, VA-based group

has also released a Compost Information Kit designed for compost users. It includes a slide rule for determining application rates, and brochures explaining compost uses to retail and commercial markets. For information on obtaining the guide or the kit, contact the council at 114 South Pitt Street, Alexandria, VA 22314, Tel:(703)739-2401.

**A Guide to Selling in the Green Industries.** Written by Dr. Lawrence C. Helms this volume features solid information for those who want to gain some basic sales skills and techniques. Available to AAN and WNGA members for \$27.50 (includes s/h) To order a copy, contact AAN Publications Tel:(202)789-2900, Fax:(202)789-1893.

**Diseases of Turfgrasses.** This is a complete work on turfgrass diseases. Is a practical manual for turfgrass management, as a thorough text, and as a scientific reference for diagnosis and treatment. Write or call for info or ask for Free Physical Science catalog. Krieger Publishing Co., P.O. Box 9542, Melbourne, FL 32902. Tel:(407)727-7270.

**Flowers for Sale: Growing and Marketing Cut Flowers, Backyard to Small Acreage.** This 197 page book by Lee Sturdivant provides ideas on how to start a simple supermarket bouquet business and details considering selling, pricing and display information, as well as business and tax tips. Offers interviews with growers, buyers and sellers from three different states as well as a comprehensive list of annuals, perennials, bulbs, trees, shrubs, vines and herbs, plus wild plants with commercial value. Available from Northwind Farm, RR 2, Box 246, Shevlin, MN 56676.

**Herbs for Sale: Growing & Marketing Herbs, Herbal Products & Herbal Know-How.** This 225 page book by Lee Sturdivant profiles a wide variety of successful herb-related businesses. Readers will learn how to stay profitable and solve problems, as well as grow and market herbs. Chapters contain down-to-earth advice on owning and operating an herb business and features chapters on "Herb Growing", "Herb Farms", and "Herbal Product." Available from Northwind Farm, RR2, Box 246, Shevlin, MN 56676.

**April 22** - UDBG Plant Sale, Fischer Greenhouse, Newark, DE. Contact 831-2531.

**April 22** - Tree Spree, Delaware Center for Horticulture and Brandywine Park. Contact (302)658-6262.

**April 25-26** - Pesticide Applicator Training Review Session, U.S. Washington Extension Bldg. Auditorium, Delaware State University, Dover, DE (Rt. 13 across from Mall) - Day 1- 8:30am-4:30pm; Day 2- 8:30am - 12 noon. Recertification credit awarded. Registration required. Contact Susan Whitney (302)831-8886 for further information.

**April 26** - Pesticide Applicator Certification Exam, Delaware State University, Dover, DE (Rt. 13 across from Mall), 1pm. Contact: Larry Towle, 1-800-282-8685 for further information.

**April 26** - Mid-Atlantic Interior Landscape Conference, Longwood Gardens, Kennett Square, PA. For more information contact: Thomas Contrisciano, Tel:(610)378-1327.

**April 26** - The 4th Annual Native Plant Seminar & Native Plant Sale, Irvine Natural Science Center on campus of St. Timothy's School, Stevenson, MD, One mile north of Baltimore Beltway Exit 22 on Greenspring Avenue. Register for seminar, members \$35, non-members \$45. Plant Sale free/open to the public:9:00am-3:00pm. For more information and brochure call the Center (410)484-2413.

**April 28** - National Arbor Day

**April 28** - Delaware Center for Horticulture Rare Plant Auction, Longwood Gardens, Kennett Square, PA. Contact DCH 658-6262.

**May 1-2, August 14-15** - Wetland Botany and Horticulture, Wetland Horticulture, Environmental Concern, Inc., St. Michaels, MD. 8am-5pm, cost \$225. Instructor: Sue McIninch. For more information, Tel:(410)745-9620 or Fax:(410)745-3517.

**May 8-12, June 19-23, September 18-22** - Wetland Delineations, Soils, & Hydrology, Wetland Delineation, Environmental Concern, Inc., St. Michaels, MD. 8am-5pm. Instructors: Mark Kraus, Marc Seelinger, cost \$775. For more information, Tel:(410)745-9620 or Fax:(410)745-3517.

**May 12** - Charles Dunham Reception. Reception honoring Charles Dunham at the UDBG, Newark, DE. Hors d'oeuvres and cash bar from 5-7 PM. RSVP required. Call 831-2531 for invitation.

**May 19** - Wetland Botany and Horticulture, Winter Botany, Environmental Concern, Inc., St. Michaels, MD. 8am-5pm. Location: Adkins Arboretum, Queen Anne, MD. Instructor: Sue McIninch, cost \$125. For more information, Tel:(410)745-9620 or Fax:(410)745-3517.

**May 21-23** - Trees, People, and the Law. A conference presented by The National Arbor Day Foundation, Arbor Day Farm/Lied Conference Center, Nebraska City, Nebraska. To register call (402)474-5655 between 8:00am and 5:00pm, Fax:(402)474-0820.

**June 1** - Native Plants, Toward a 21st-Century Garden, Brooklyn Botanic Garden, Brooklyn, NY. Registration is required as seating is limited. The fee for symposium is \$99 for Brooklyn Botanic Garden members, \$119 for nonmembers. For information, call Lisa Katzenstein, Tel:(718)622-4433, ext.259.

**June 5-6** - Wetland Evaluation and Mitigation, Wetland Evaluation Methods, Environmental Concern, Inc., St. Michaels, MD. 8am-5pm, cost \$475. Instructors: Candy Bartoldus/Mark Kraus. For more information, Tel:(410)745-9620 or Fax:(410)745-3517.

**June 6, 8, 13** - Lawn Establishment and Maintenance Short Course. Ornamentals Short Course Series. Kent County Extension Office, Dover, DE. Contact Susan Barton, 831-2531.

**June 7-9** - Wetland Evaluation and Mitigation, Wetland Mitigation, Environmental Concerns, Inc., St. Michaels, MD. 8am-5pm, cost \$575. Instructor: Edgar Garbisch. For information, Tel:(410)745-9620 or Fax:(410)745-3517.

**June 27-28** - Pesticide Applicator Training Review Session, U.S. Washington Extension Bldg. Auditorium, Delaware State University, Dover, DE (Rt.13 across from Mall) Day 1- 8:30am -4:30pm; Day 2-8:30 - 12 noon. Recertification credit awarded. Registration required. Contact: Susan Whitney (302)831-8866 for further information.

**June 27, 29, July 6, 11** - Woody Plant ID Short Course. Ornamentals Short Course Series. Fischer Greenhouse, U of D. Contact Susan Barton, 831-2531.

**June 28** - Pesticide Applicator Certification Exam, Delaware State University, Dover, DE (Rt.13, across from Mall), 1pm. Contact: Larry Towle, 1-800-282-8685 for further information.

**July 8, 9, 10, 11 & 12** (Educational Seminars) **July 9, 10 & 11** - (All-Industry Trade Show) - Cincinnati Convention Center, Cincinnati, Ohio. Ohio International Floral Short Course - formerly International Floriculture Industry Short Course. Sponsored by the Ohio Florists' Association and The Ohio State University. For more information contact: Ohio Florists' Association, 2130 Stella Court, Suite 200, Columbus, OH 43215-1033, Tel: (614)487-1117, FAX: 614-487-1216.

**July 9-11** - MANTS, Mid-Atlantic Nurserymen's Trade Show, Baltimore Convention Center. Contact: Carville Akehurst, Tel:(410)882-5300, Fax:(410)882-0535.

**July 10-11** - Wetland Delineations, Soils, & Hydrology, Hydric and Hydromorphic Soils Related to Wetland Ecology and Jurisdictional Determinations, Environmental Concern Inc., St. Michaels, MD. 8am-5pm, cost \$475. Instructor: Albert Rizzo. For more information, Tel:(410)745-9620, Fax:(410)745-3517.

**July 11, 13** - Greenhouse Management Short Course. Ornamentals Short Course Series. Kent County Extension Office, Dover, DE. Contact Susan Barton, 831-2531.

**July 11-12** - Villanova University/**July 14-15** - Connecticut College, New London, CT - Natural Design As Landscape Art: Innovation with Roots in the Past. Villanova University, Villanova, PA. Co-sponsored by: New Directions in the American Landscape, The Connecticut College Arboretum, The Morris Arboretum of the University of Pennsylvania. For more information call: PA(215)247-5777, Ext. 156 or (215)836-1051; CT(203)439-2140 or (215)836-1051.

**July 12** - Wetland Delineations, Soils, & Hydrology, Hydric and Hydromorphic, Wetland Hydrology, Environmental Concern Inc., St. Michaels, MD. 8am-5pm, cost \$300. Instructor: Edgar W. Garbisch. For more information Tel:(410)745-9620, Fax:(410)745-3517.

**July 18, 20** - Poinsettia School. Ornamentals Short Course Series. Kent County Extension Office, Dover, DE. Contact Susan Barton, 831-2531.

**July 24-28** - Wetland Botany and Horticulture, Field Wetland Botany, Environmental Concern Inc., St. Michaels, MD, 8am-5pm, cost \$600. Instructors: Sue McIninch, Michael Rivera and Mark Kraus. For More information, Tel:(410)745-9620, Fax:(410)745-3517.

**July 25-27** - East-Penn Allied Nursery Trade Show. Tel:(717)238-1673.

**July 26-29** - AAN Convention, Twin Cities, MN. Tel:(202)789-2900.

**July 30 - August 4** - Perennial Plant Association Symposium, Minneapolis, MN. Contact: Dr. Steven Still, (614)771-8431.

**August 1, 3, 8** - Diagnosis and Control of Diseases on Woody Landscape Plants. Ornamentals Short Course Series. Fischer Greenhouse, U of D. Contact Susan Barton, 831-2531.

**August 4-5** - 1995 American Conifer Society National Meeting, Asheville, NC. Contact: (313)665-8171.

**August 8-9** - Computer Workshop for Nurserymen and Greenhouse Growers, Montgomery College, Germantown Campus. Call: the Central Maryland Research/Education Center for more information (301)596-9413. In the western Maryland area call: Russell Balge, Western Maryland Research/Education Center (301)432-4491. On the Eastern shore call: Marc Tefteau, Wye Research/Education Center (410)827-8056.

**August 9** - Farm and Home Field Day, University of Delaware, Research & Education Center, Georgetown, 8:30am. Contact: Jay Windsor (302)856-7303 for further information.

**August 16** - Summer Turf and Nursery Expo, Joseph Wick Nurseries, Smyrna, DE. Contact Marianne McGloin 302-677-1895.

**September 19, 21** - Pruning and Landscape Maintenance Short Course. Ornamentals Short Course Series. Fischer Greenhouse, U of D. Contact Susan Barton, 831-2531.

**September 26, 28, October 3, 5, 10, 12** - Business Management Short Course. Ornamentals Short Course Series. Fischer Greenhouse, U of D. Contact Susan Barton, 831-2531.

**November 13-17** - Wetland Delineations, Soils, & Hydrology, Winter Wetland Delineation, Environmental Concern Inc., St. Michaels MD. 8am-5pm, cost \$775. Instructors: Mark Kraus and Sue McIninch. For more information, Tel:(410)745-9620, Fax:(410)745-3517.

**January 4-6, 1996** - Winter Mants, Baltimore Convention Center, MD. contact: Carville Akehurst, Tel:(410)256-1799, Fax:(410)256-2208.

**January 18, 19, 1996** - Delaware Horticulture Industry Expo. Sheraton Inn, Dover, DE. Contact Marianne McGloin (302)677-1895.

**February 1-4, 1996** - WNGA/NLA/GCA Management Clinic, Louisville, KY. Contact: AAN.

