

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

This is an exciting time to be on the D.A.N. board; we are getting statewide public exposure and moving forward with many programs that will have a positive impact on the nursery industry in Delaware.

The D.A.N. has lobbied with committees in the state House and Senate to request funding for an additional nursery inspector for the Dept. of Ag., a position vital to our growing nursery industry. As of today, no decision has been made, so call your legislators and tell them you support funding this important position.

The D.A.N. board has authorized the first installment for the industry-wide survey to be conducted by the Delaware Dept. of Ag. The survey will be funded jointly by the D.A.N. and Dept. of Ag. This summer an assistant will begin compiling a mailing list for the survey that will take place next year. The survey will define the extent of the nursery/landscape industry and its importance to the economy of Delaware. It will be used to lobby for positions or laws that affect the industry and will provide a baseline for future surveys.

We hope you read the in-depth article on the nursery industry in the June 12th issue of the Wilmington News Journal. The article was written in response to our January press release for the 1995 D.A.N. Plants of the Year. The article sited the greens industry as the fastest-growing segment of Delaware agriculture, accounting for more than \$100 million annually.

Ballots have been mailed to the selection committee for 1996 Plant of the Year. The selection will be made earlier to give you more lead time for production. Be sure to take advantage of marketing materials for the 1995 Plants of the Year this summer and fall.

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

Let's start with a few reminders: The Turf and Nursery Expo will be held at Joseph Wicks Nursery on Wednesday, August 16. Registration forms will be sent in a couple of weeks. Exhibitors, there is still booth space available. Please contact Marianne to reserve your booth today! The Benefit Auction is scheduled for Saturday, September 16 at the Delaware Center for Horticulture. Diane Hill is the head of the Auction Committee. Donations are being accepted at this time. Please contact Diane Hill at (302) 239-4675 for more information. The Delaware Horticulture Industry Expo is January 17 & 18. Currently there are twenty-three exhibitors. The cost of a booth is \$250.00 before September 1, 1995. Please call Marianne if you are interested in exhibiting at the show. The Turf Conference will be held in Hockessin on November 15. Exhibitor information will be sent shortly.

Now is a good time to prepare for the upcoming CNP exam. The exam will take place October 25 at the Dept. of Agriculture. Short courses and manuals are currently available. For more information on the short courses, please contact Susan Barton at (302) 831-2531.

**Legislative News**

The Promotion Order was unanimously defeated. For more detail, see the article that appears later in this issue. There is a worker's compensation protection bill (HR1715) currently in the House of Representatives. The purpose of the bill is to restore protection of the worker's compensation system to both employers and employees. Currently, employees who are injured on the job and are receiving worker's compensation benefits can also sue their employers for damages. This bill will protect the employer from having to pay

both worker's compensation and damages to their employees. As a result, nursery growers and other agricultural employers are the only industry group in America not protected from litigation that all other industries receive. I have written a letter to Rep. Castle to support this bill. I urge everyone to do the same. If anyone is interested in sending a letter to Rep. Castle, you can contact Marianne for copies of her letter. It can remain on DAN letterhead if you prefer or copy onto your own letterhead.

A message to our associate members: You, too, can help increase the DAN membership. If you know of any customers who are interested and would be beneficial to our membership, please call with any leads. I also have membership applications that I can send to you to keep on hand. One of our associate members was responsible for a large percentage of new members in 1995. Thank you for supporting the DAN.

Finally, I hope everyone has a prosperous and profitable summer. Hope to see you at the Turf and Nursery Expo!

### **INTERNSHIP OPPORTUNITY REQUESTED**

Two students in their final year at the Pretoria Technicon, South Africa (E.M. de Klerk and F. Botha) are completing the National Diploma Course in Landscape Technology (three year course). As part of their curriculum, they are required to complete an internship. They wrote to the D.A.N. to solicit internship sites. If you are interested, you can respond to Minjonet Ladies Hostel, P.O. Box 19793, Technikon Pretoria, 0001 Pretoria-West, South Africa.

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

The Ornamental Short Course series session II has begun. We will be offering Woody Landscape Plants, Greenhouse Management, Poinsettia School and Diagnosis & Control of Diseases on Woody Ornamental Plants this summer. A registration brochure was mailed last month. If you did not receive one or have lost your copy, call Dot Milsom at 831-2531. Diagnosis & Control of Diseases on Woody Ornamental Plants is listed in the brochure at \$95 and \$75. The correct price is \$75. 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.

A reception honoring Charles Dunham, professor emeritus, Plant & Soil Sciences Department, University of Delaware was held at the UDBG on May 12 from 5 to 7 PM. The event was truly a gala garden party. Norm Hedrick spoke for the D.A.N. thanking Charlie for his role in establishing the association and serving the nursery industry. At the reception, plans were unveiled for the proposed entrance garden to the UDBG. We hope the enthusiasm of the reception helps begin the fundraising for this exciting new garden. When you receive your letter and fund-raising card, think about making a contribution to a garden that will make the UDBG more accessible to the community. By reaching more people, we can spread the word about new and exciting plants that can be grown in Delaware landscapes.

The program is set for the Turf and Nursery Expo scheduled for August 16, 1995 at Joseph Wick Nurseries in Smyrna. Educational seminars include Exciting New Perennials (Dale Hendriks, North Creek Nurseries), Preventing Common Plant Problems (Jay Windsor, DE Coop. Extension), Handling B & B and Bare Root Plants (Sue Barton, DE Coop. Extension) and Turf and Landscape Weed Control (Gordon Johnson, DE Coop. Extension). Our traditional roast beef lunch and a tour of Joseph Wick Nurseries will round out the day. Hope to see you all in August!

The garden center tour sponsored by Delaware and Pennsylvania is scheduled for November 9, 1995. We decided to try something new. We plan to visit Behnke Nurseries, Homestead Gardens and Valley View Nurseries. We have been to all three of these garden centers before but this time we will see how they set up for Christmas. It should be a great learning experience and a lot of fun. You'll receive a registration flyer in late September.

The Delaware Turfgrass Conference is scheduled for November 15, 1995. We have lined up a great headline speaker--Dave Shetlar from Ohio State University. He will give two talks: "Improved monitoring and sampling to better time insect and mite control in the landscape" and "Biological, biorational controls for turfgrass insects: The ones that work and the ones that don't." Again, look for a registration flyer in September.

The UDBG and Plant and Soil Sciences Department will sponsor its annual research expo and new plant give-away on September 7 at 5:00 PM. John Frett tells me he is planning to distribute *Heptacodium*, (one of this year's Gold Medal Awards) and a new release from Mt. Cuba. So you won't want to miss this year's event.

## **CREATIVITY** **Susan Barton** **University of Delaware**

The following is a summary of a talk given by DeWitt Jones, National Geographic Photographer at the 1995 AAN Management Clinic in Louisville, KY.

DeWitt Jones wowed the crowd in Louisville with the most inspiring talk I have ever heard and seen. Of course his stunning photographs were part of the allure, but his message was equally as significant. I hope I can capture the essence of his talk in words and share it with you.

Jones described creativity as falling in love with the world and achieving passion. He asked us to consider our personal vision and our company vision. Then he shared his personal vision, comprised of three basic components:

1. seize the day
2. make your life your art
3. celebrate what is right with the world and don't focus on what is wrong.

Jones turned around the common phrase, "I won't believe it until I see it." and suggested that "I won't see it until I believe it."

Using the example of photography, he challenged the audience to search for the right perspective. He showed a lovely photograph of Yosemite falls. The photo looked like the cover of a travel brochure. But in the next photo, he'd changed to a telephoto lens and the shot included one spray of water from a rock outcropping and a single pine tree. It was much more powerful.

Next, he suggested we should decide which elements demand the right attention. In photography, that is achieved by focus. A small

ground squirrel jumps out from a photo with yellow flowers blurred in the background. But to appreciate the intricacy of an Indian cliff dwelling, the entire photograph must be in focus.

Jones explained that in photography, as in life, there is more than one right answer. He cautioned “Don’t stop at the first right answer. Celebrate what leads to multiple right answers. Encourage diversity and change and reframe problems into opportunities.” Sometimes it’s important to break the pattern. Question what you are doing even when things are going well. And finally Jones said, “Don’t be afraid to make mistakes.”

Many of the “right answers” Jones referred to come from paying attention and being a good listener. When things become mundane, he suggests regaining passion by acting child-like (not childish). In a shoot of Old Faithful geyser at Yellowstone National Park, Jones took several rolls of huge impressive geyser photos. But he wasn’t happy with the results. He tried changing lens and took photos through the crowd that distorted both faces and scenery. As he worked, he realized that the story of Old Faithful is no longer the geyser itself, but the people that come to see it. Going back to a normal lens, he took a touching photo of a son and father holding hands as they watched the geyser.

DeWitt Jones doesn’t rely on luck to be in the right place at the right time for a photograph. He uses his intellect to put himself in the place of most potential. Vision without technique is worthless and it’s intellect that trains technique. But once the stage is set, DeWitt Jones tells his intellect to be quiet and lets inspiration take over.

I left the ballroom in Louisville with a new attitude and strategy for accessing my own creativity.

**OPEN BOOK MANAGEMENT**  
**Susan Barton**  
**University of Delaware**

The following is a summary of a talk given by George Gendron, Editor-In-Chief, *Inc.* Magazine at the 1995 AAN Management Clinic in Louisville, KY.

George Gendron began by outlining the two major factors affecting small business today. First, technology is advancing rapidly and successful businesses must incorporate personal computers into every aspect of their business. Second, there are now an unprecedented number of start-up companies forming each year. In fact, seven percent of the adult population is in the process of starting a business. There are few barriers to entry into the marketplace but due to the enhanced competition, managerial standards are rising. In the past, there have been many successful, but mismanaged, businesses. That is no longer possible.

The stresses of running a small business today are so great that it is almost impossible for a single owner to “do it all.” We must redesign our businesses to reduce stress. One method of redesign is open book management. Open book management is summarized in three basic recommendations:

1. Give all the people in the organization all the information they need about financial operations all the time. (Let them know how you make your money.)
2. Educate your employees about this information.
3. Tie all additional incremental personal gains into increasing the value of the business.

George Gendron explained that business owners and key managers are all involved in the “game

of business.” They get to make decisions and watch the results. The winner of the “game” is the one who makes the most money. Most employees don’t even know the “game” exists let alone have the opportunity to contribute. With open book management, you create an environment in which all your people can think, act, behave and be rewarded or punished in the same way you are, in the “game of business.”

Once an employee of a software development company learned that the way the company really made money on software was on upgrades rather than the original purchase, he suggested they give away the first round of a new product. This technique helped the company break into a well-established market and create a customer base. They were then in a position to sell upgrades and make money. This employee could only make this suggestion once he knew the true way the company worked--how they made their money.

Many owners resist the idea of sharing financial information with employees. A clothing label manufacturer had asked employees to cut costs repeatedly. At first costs went down but they slowly drifted back up. Finally, the owner realized that employees were blocked by a “room full of money” concept of the owner. To dramatize how fragile the company’s economics were, the owner brought the entire staff to a high school gym and put a pile of play money in center court representing their yearly budget. He asked each department one by one to remove their portion of the budget and all the employees watched the pile dwindle. By the end, the employees realized how small the profit was in comparison to the expenditures. The next day the manager of research and development asked to see the owner to discuss return on investment calculations for several research projects.

Owners fear that employees will not like the amount of money the owner and key managers

make. In fact, employees almost always think the owner makes more than he or she does.

Open book management is a mechanism to make business a participatory sport rather than a spectator sport. Employees get the opportunity to try to make the business successful. One motivator is a profit-sharing program. But it must be accompanied with information that helps employees make a difference. If employees receive a share of the profit without information, the money is perceived as a bonus. They don't realize they earned it. The trick is to develop a system that ties people to the true way your business makes money.

For example, the critical variable for a motel is occupancy. Therefore, employee incentive should be based on occupancy figures and not on reducing costs. One motel that recognized this began to share occupancy rates with employees. To increase occupancy, maids left personal notes for guests and managers began to collect demographic information that allowed them to call past guests and ask them when they planned to visit the St. Louis area. Employees that understood the business were able to devise strategies to increase occupancy and ultimately improve profit.

In many cases, the great motivator is a passion for work and not money. By providing the necessary information and allowing employees to participate in the game of your business, you may be surprised at how they begin to care and try to make the company a success.

## **INNOVATIVE HERBICIDE APPLICATION METHODS AND THEIR POTENTIAL FOR USE IN THE NURSERY AND LANDSCAPE INDUSTRIES**

**Jeffrey F. Derr, Associate Professor  
Virginia Polytechnic Institute and State  
University**

Chemical weed control is an important weed management option in nursery crop production and landscape maintenance. Improved methods of herbicide delivery can increase efficacy of chemical control and minimize off-site movement, applicator exposure, and incorrect herbicide application. Certain innovative technologies show potential for addressing these issues in the nursery industry. Slow-release herbicide tablets have shown promise in container production. Horticultural collars, treated paper, and treated mulch are potential ways of applying herbicides in container crop production and/or landscape maintenance. Horticultural collars contain herbicides between two layers of a carrier such as a landscape fabric. A rapidly degradable paper can be pretreated with an herbicide for a precise application rate. Mulch can be treated with an herbicide prior to use in the landscape for improved weed control. Herbicides applied through the clip-cut pruning system could control weeds selectively in nurseries and landscapes. Each of these methods may address one or more concerns about off-site movement, calibration, and applicator exposure to pesticides.

Weed control is an important practice in both nursery crop production and landscape maintenance. There are differences in the major weed problems and weed management practices between these distinct areas of the nursery industry.

Chemical control of weeds is used extensively in both nursery crop production and maintenance. As with other crops, there are concerns in the

nursery industry about off-site movement of pesticides through herbicide leaching, runoff, and spray drift. Current research is addressing the off-site movement of herbicides from container nurseries. Additional concerns about pesticide use include applicator exposure and accurate calibration.

Public- and private - sector scientists have been researching novel methods of herbicide application that may have applications for the nursery and landscape industries. These new methods include slow-release herbicide formulations, herbicide collars, herbicide-treated paper, herbicide-treated mulch, and herbicides applied with pruning shears. These techniques can influence off-site movement and other concerns about herbicide use in container production, field production, and/or landscape maintenance.

### **Slow-release herbicide formulations**

Nursery crops are often grown for several years. In container production, a plant may grow in the same pot for 1 to 3 years. In field production, even longer periods of time are often required. Plants in landscapes may be maintained for many years. Hence, weed control must be maintained for a longer period of time in the nursery industry than with annual crops. Herbicides used in the nursery industry, however, are ones that generally were developed initially for use in agronomic crops. With annual crops, the required length of weed control may be as short as 1 or 2 months. To obtain season-long weed control in container production, preemergence herbicides are applied every 2 to 3 months. Multiple applications of preemergence herbicides per year are also made in field production and landscape maintenance.

Herbicides with long soil residual activity can pose a carryover problem when used in annual crops. However, long-residual herbicides can be advantageous in perennial crops. Increasing the

herbicide rate is one way to increase the length of soil residual for a given herbicide. However, this could increase the potential for crop damage, as well as concerns about off-site movement. Use of slow-release herbicides are an alternative way to increase soil residual.

Problems associated with herbicide use in container production include proper calibration, concerns about herbicide runoff from plastic or gravel (especially for chemicals that fall between containers), and the need for multiple applications. One type of slow-release formulation that addresses these concerns is herbicide tablets applied directly to containers.

**Slow-release tablets.** Slow-release tablets are a porous pellet containing an inert material such as plaster of paris or dicalcium phosphate, plus a preemergence herbicide. As these tablets are wetted by irrigation, small amounts of the herbicide are gradually released over an extended period of time. The rate of herbicide release can be increased by increasing the herbicide concentration, or by changing the size or porosity of the tablet.

**Other slow-release herbicide formulations.** There have been other types of slow-release formulations evaluated, some with implications for nursery use. Other controlled-release formulations have used starch xanthide, pine kraft lignin, and various polymers to control the herbicide release rate. Nursery operators currently use slow-release fertilizers in production, and, according to some researchers, the currently available technology allows for the development of controlled-release herbicides.

**Potential advantages of slow-release formulations.** Overall herbicide rates could be reduced using a controlled-release material compared to a granular or sprayable formulation. A minimum threshold concentration needed for weed control could be maintained over an

extended period using slow-release technology. For currently available herbicide formulations, an initial high concentration of chemical occurs in the medium surface due to rapid release from the carrier, followed by a decline in herbicide concentration over time. Therefore, a rate much higher than the minimum threshold rate must be applied in a quick-release formulation to maintain weed control over time.

Because the active ingredient in controlled-release formulations is released slowly into the growing medium, there should be less potential for herbicide leaching. With direct applications of formulations such as tablets to individual containers, no herbicide is applied directly to the gravel or plastic beneath the containers. This results in less herbicide used per acre of container stock, along with reducing the potential for herbicide runoff from container production areas. It appears that the major concern about herbicide movement from container production areas is from the chemical that falls between pots during broadcast applications, as opposed to herbicide leaching out the bottom of containers.

For slow-release formulations, less labor is required for herbicide application because fewer treatments would be required per year. For tablet formulations, no calibration would be required if tablet size could be adjusted to container size. For example, an application rate of two tablets for a 1-gal container, four tablets for a 2-gal container, etc., would reduce the potential for over-application, which increases environmental concerns, or under-application, which results in unacceptable weed control. As with granular applications, no mixing or spraying would be required for tablet application, thus reducing applicator exposure and chemical drift.

**Difficulties associated with the development of slow-release formulations.** Uniform herbicide distribution from a tablet in a container would be required for acceptable weed control. Low-

water-soluble chemicals may not be effective in such formulations because the chemical must move laterally from the tablet to cover the medium surface. The release rate must be sufficient to maintain a minimum threshold concentration needed for weed control over an extended period. Marketing and regulatory hurdles also would have to be addressed in the development of slow-release herbicides.

### **Herbicide collar**

Researchers have attempted to develop physical barriers to control weeds in container production. The interest in physical barriers developed from the use of landscape fabrics, which were introduced as a replacement for solid polyethylene (black plastic) for weed control in established plantings. Disks cut out of paper deteriorated over time, allowing weed growth; photodecomposition of geotextiles lacking UV inhibitors also led to weed growth. Rolling of the edges of black plastic resulted in weeds germinating along the edge of the material. Physical barriers composed of synthetic or natural fibers may be insufficient to control weeds. Fiberglass disks treated with various herbicides were evaluated in containers. Liverworts (*Marchantia* spp.) grew, however, on top of the moist fiberglass, and weeds often grew at the pot edge not covered by the disk.

Combinations of a landscape fabric with a herbicide may provide improved weed control in container production. Such a product also could be used in field applications and, if covered by mulch, could be used for weed control in landscapes. Collars containing various herbicides have controlled weeds better and longer than a standard granular herbicide application, or a collar lacking a herbicide. The only place where weeds were able to grow in the collar-plus-herbicide treatments were in any gaps between the collar and the pot edge or the plant stem.

**Advantages of a horticultural collar.** The horticultural collar controlled weeds longer and better than standard herbicide applications to container-grown plants. Improved weed control by the collar decreases the labor required for hand-weeding and multiple herbicide applications. Slow-release herbicide formulations could be included in the collar. Because the collar covers the entire medium surface, any nursery herbicide, regardless of water solubility, could be included in the collar. In contrast, the tablets discussed previously require water soluble herbicides to obtain coverage of the entire medium surface. Fertilizers and other chemicals could be added to the collar, resulting in a multiple chemical delivery system.

Blow-over of plants, especially trees, often occurs in container nurseries. If a herbicide and fertilizer are top-dressed on the medium surface, blow-over causes the chemicals to spill out of the pot. If the chemicals are not replaced, nutrient deficiencies and poor weed control develop later in the growing season. If a pot containing a collar blows over, the collar can be reinstalled with no loss of chemical because the herbicide and fertilizer are contained between the fabric layers.

No mixing, spaying, or calibration is required because the correct dosage would already be present in the collar. Because the chemical is located between two layers of fabric, there would be minimal chemical exposure to the user. In addition, because the herbicide would only be applied directly to the pot, with no chemical applied between pots, lower overall herbicide rates would be required, along with lower potential for herbicide runoff.

**Difficulties associated with development of horticultural collars.** The collar must be cost-effective compared with standard applications of herbicides and fertilizers in the nursery. Disposal of the fabric collar could be a concern, although

the collar could be left in place around the plant when it is installed in the landscape, similar to the use of a landscape fabric. As with other new techniques of pesticide application, marketing and regulatory hurdles would have to be overcome in development of such a product.

### **Herbicide-treated paper**

Several researchers have evaluated the use of a water-soluble paper to deliver herbicides to landscape plantings. One such product has been referred to as a herbisheet (American Cyanamid, Princeton, N.J.). The paper pretreated with the correct herbicide rate, could be cut to fit the landscape bed to be treated. Irrigation or rainfall dissolves the paper, releasing the herbicide to the soil or mulch surface. A thin layer of mulch could be used to cover the paper.

**Advantages to herbicide-treated paper.** No calibration, mixing, or spraying are required by the user of the herbisheet. Because there is no calibration, over-application is eliminated because the chemical is applied only to the intended area. The application also eliminates the problem of drift, which can occur for sprayed herbicides, and confinement of granules to a given area when broadcast applications are made.

**Difficulties with herbicide-treated paper.** The applicator would be exposed to the chemical during the cutting and installation process. Cutting the paper to fit an area may be time-consuming. Wind may make installation difficult. Residues of the paper may persist after wetting due to incomplete dissolving of the product, posing an aesthetic problem unless covered by mulch. Variation in irrigation practices or rainfall could affect paper decomposition and the herbicide release rate. Marketing and regulatory concerns would have to be addressed.

## **Herbicide-treated mulch**

Mulching is a common weed control practice in landscape maintenance. Mulching will not control all weeds, and organic mulch may become a growing medium for weeds as it decomposes. Herbicides often are applied to mulch to improve weed control. An additional possibility is the use of mulch that has been pretreated with preemergence herbicides.

**Advantages of herbicide-treated mulch.** Weed control in landscapes should improve when a herbicide-treated mulch is used, compared to untreated mulch. The only calibration required is monitoring the mulch depth to ensure the optimum herbicide application rate. No chemical mixing or spraying would be required for application. Herbicide would be applied only to the area intended to be treated. Also, herbicide-treated mulch could be added as a top layer during the filling of pots in assembly-line fashion for container production.

**Difficulties associated with herbicide-treated mulch.** Over mulching, a common problem in landscapes, would result in excessive herbicide application. Users would be exposed to the herbicides during spreading of the mulch. Additionally, there may be restrictions on use in mixed plantings if herbicide-sensitive ornamentals are present. Herbicide-treated mulch would have to be stored in a different manner than untreated mulch. Studies would be needed to address the length of time herbicide-treated mulch could be stored prior to use. Marketing and regulatory concerns would also have to be addressed.

## **Herbicide/hand pruners**

A common problem with using hand pruners for collecting plant cuttings is maintaining sterile conditions on the blades in order to avoid spread of diseases. Modified hand pruners that have a

vial attached that slowly drips a disinfecting solution over the blades was developed to maintain sterile conditions. This is known as the KlipKleen system (KlipKleen Pruning System, Bloomland Special Products, Atlanta, Ga.). An adaptation of this concept would be to substitute a solution containing a postemergence herbicide within the vial. As a weed stem is cut, some of the herbicide-containing solution would be absorbed by the plant stem from the pruner blades. If a systemic chemical were used, the herbicide could translocate to roots and other leaves and stems, resulting in plant death. Such a product could be used to control vines in landscape hedges or to control tall weeds in containers.

**Advantages with use of herbicide/band pruners.** At present, no selective chemical exists that allows broadcast applications to nursery stock for vine control. Using this system, vines in landscape hedges could be controlled selectively. The chemical would be applied only to the intended weed, resulting in minimal herbicide usage. Because no spraying would be involved, concerns about spray drift to desired plants would be eliminated.

**Difficulties associated with herbicide/band pruners.** Non-target plants could be injured through dripping of the herbicide solution from the pruners or through root exudation from treated plants. Users could be exposed to the herbicide through use of this system. Regulatory concerns would have to be addressed.

## **Conclusions**

Development of new technologies could address some of the environmental concerns associated with herbicide use in nurseries and landscapes. These innovative methods have potential for improved weed management in such areas. Cooperation among manufacturers, nursery operators, and researchers will be needed to

develop these concepts into effective products for the industry.

Excerpted from *HortTechnology* 4(4), Oct./Dec.

## **CONTROL OF LIVERWORTS IN PERENNIAL PLANT PRODUCTION**

**Stanton Gill, Regional Specialist  
University of Maryland**

Perennial plant growers deal with many different disease and insect problems each year but weed control remains the number one problem. For perennial plant growers who grow in containers one especially troublesome weed is liverwort. This is not your standard dicot or grass-type weed. Liverwort, *Marchantia polymorpha*, is a non-vascular bryophyte and one of the first land plants that evolved to adapt to the terrestrial environment. Liverwort has several layers of cells and the ability of forking and growing in different directions. It appears flat and scaly in growth habit. Once established in a nursery, liverwort thrives in the moist, acidic, high organic content media conditions that are maintained in perennial plant containers. Once it becomes established in a container, liverwort quickly covers the surface. It competes with the perennial plant for water and nutrients.

The most common liverwort encountered in nurseries is leafy liverwort. Leafy liverwort reproduces by vegetative propagules, or gemmae. The spores, or sexual stages, are air borne. In perennial plant production the growing media is usually slightly acidic and held on the moist side. These conditions fit the exacting requirements of the air borne spores for germination and production of the vegetative thallus.

Once you have this weed established in your nursery the vegetative propagules are commonly splashed to adjacent pots. Often, vegetative liverwort propagules splash onto the plant parts used as cuttings from another plant growing in pots with liverwort on the soil surface.

If you are propagating perennial plants from cuttings, the surfaces can be disinfected by

soaking in a dilute solution of chlorox, using 1 part chlorox to 10 parts of water with a small amount of liquid soap to act as a wetting agent. To prevent leaf liverwort from establishing in pots not already infested, you can try putting a 1/2 inch layer of fly ash on the surface of the soil. The fly ash will create a dry layer that is not conducive for establishment. A 1/2 inch layer of sharp sand should give similar protection.

For established plants growing in pots that have leafy liverwort, it is best to physically remove the liverwort. This is time consuming but the effort is worth it if you follow up with an application of an appropriate premergent herbicide. In the first year of his field study, Andrew Senesac found that Surflan 4WS at 3 lbs a.i. /A and Ronstar 2G at 4lbs

a.i./A gave good control levels. Prior to each of the treatments, all liverworts were physically removed from the surface. Six different perennial plants were involved in the field study. Ronstar and Surflan only allowed 5-6% regrowth of liverwort after 85 days. Two fungicide treatments were also evaluated but allowed 59-70% regrowth, which was not different from the weedy control. Senesac also found that Rout and Goal gave good control levels of liverwort but these products are not labelled for use in container grown perennials.

The cryptocidal soap, Sharpshooter, has a label for use on perennials. Sharpshooter physically burns back the liverworts. Since Sharpshooter is not selective it would also damage many perennials plants that are in active growth. Sharpshooter can be applied in late fall or early spring when the top portion of the plant is either dead or not present. Sharpshooter is not systemic. A possible program would be to apply Sharpshooter in spring before new growth emerges from the perennial plant then follow this up with an application of either Surflan or Ronstar.

Reprinted from *Free State Nursery News*, February, 1995.

**DISEASE MANAGEMENT FOR LAWN,  
Burpee has some advice.  
Lori Ward Bocher**

With some tips he offered at the Wisconsin Turfgrass & Greenscape Expo '95, Burpee advised those in the lawn care business to determine how to formulate a disease management policy.

"Any policy must be based on disease prevention. With most turfgrass diseases, it's much more difficult to control diseases once symptoms have developed than it is to develop some type of preventive program.

"With some of the foliar diseases, such as dollar spot or brown patch in Northern states, you can wait until you see the initial symptoms, go in with some type of control program, and usually get some pretty good suppression," Bruce admitted.

"But with most other diseases, particularly the diseases of roots and crowns, once the symptoms appear, you're going to lose a lot of turf even if you initiate a control program," he added.

According to Burpee, a disease management policy for a lawn care company must also ask the question: How can the lawn care company and the homeowner work together?

**Homeowner responsibilities**

Burpee suggested giving homeowners a list of their responsibilities, which include:

**Water the lawn.** "The most disease resistant lawn is a healthy lawn. You can't let the grass go into drought stress because many diseases, such as dollar spot and necrotic ring spot, are predisposed by drought stress," he said.

**Schedule lawn watering to minimize disease.**

Avoid watering in the late afternoon and in the evening.

"For many diseases, particularly the foliar diseases, the fungi that cause the disease need somewhere around 14 hours or more of continuous leaf wetness in order to grow on the leaf, penetrate the leaf and cause disease," Burpee explained.

"Anything that can be done on a lawn to minimize the duration of leaf wetness is going to minimize the severity of disease. If you water in the morning or early-afternoon, there's a better chance that the leaf will dry out before 14 hours," he said.

**Avoid mowing Kentucky bluegrass and tall fescue at less than two inches.** "If you mow these grasses at less than two inches, it puts too much stress on them. They have not been bred for short mowing heights. If you mow them short, they can't produce enough carbohydrates to supply the crowns and the roots with enough food. This puts them under nutrient stress which can predispose them to certain diseases," he said.

**Decrease shade and increase air circulation to enhance drying of turf.** "This gets around to the leaf wetness story again. Anything that you can do to dry out the foliage as soon as possible, such as decreasing shade or pruning shrubs so that you get better air circulation over the lawn, is going to decrease foliar wetness."

"However, it's difficult to convince homeowners to do this. They like shade and hedges and fences. But at least explain to them why there may be a problem if they don't have good air movement, or if they have too much shade."

**Homeowner or company responsibilities**

According to Burpee, either the home owner or the lawn care company should be responsible for these next steps toward disease prevention, depending on the lawn care service contract. If the homeowner is responsible, it would be helpful for the lawn care company to advise the homeowner of these management tips.

**Apply fertilizer at the proper rates and times.** "All lawns need fertilizer. Universities have done tests to determine the optimum amount of fertilizer and the timing of fertilizer applications for your particular area, and for the particular species of grass that you're growing. Check with your local extension people," Burpee said.

Burpee recommended applying 50 percent or more of the total yearly nitrogen in fall. "That's when cool season grasses are producing most of their tillers. If you've got quite a bit of nitrogen available to the plant while it's tillering, then your lawn is going to fill in and get thicker rather than just produce a lot of foliage that grows straight up."

"Often people put excess fertilizer down in the Spring. At that time of the year, because of temperature and light conditions, cool season grasses are not tillering; they're just producing a lot of foliage. Also, in the springtime, most of your cool season grasses are putting down the bulk of their new root system. And high amounts of nitrogen in the Spring will decrease root development," Burpee added.

"The only drawback for heavy fertilizer applications in the Fall is the potential for runoff and leaching of nitrogen if fertilizer is put on too late and the plant doesn't have a chance to take it up. This is where timing for a particular region becomes important."

Burpee also pointed out that slow release nitrogen is not necessary for monthly applications. But if

nitrogen is applied every six-to-eight weeks, 30 to 50 percent slow-release nitrogen is required.

Soil tests should be used to determine the need for phosphorus, potassium and minor elements; there is no good soil test for nitrogen, he said.

**Limit thatch thickness to 1/2-inch or less.**

"Thatch can harbor pathogens in the turfgrass. And the pathogens can utilize the thatch as nutrients, particularly when the turfgrass is not growing vigorously.

"Also, if you have a lot of your turfgrass roots growing in thatch rather than in soil, you're putting extra stress on the turf which can predispose it to disease. The roots that are growing in thatch can't take up nutrients as well as they can in soil, and they are more susceptible to drought stress.

"Clippings (left on the lawn) have nothing to do with thatch. Many, many studies have shown this. Thatch is a mixture of living and dead roots, rhizomes and stolons. Leaf clippings do not add to the accumulation of thatch."

If there is a heavy thatch, it will take heavy verticutting, not just aerification, to help solve the problem, according to Burpee.

**Seed or overseed with disease resistant cultivars.** "There's more and more information on this. Try to keep up-to-date on which cultivars have some disease resistance,"

**Use recommended seeding or overseeding rates.** "It's common to use too much seed when overseeding. More is not better. You end up creating too much competition and defeating the whole purpose of overseeding. Seeding and overseeding rates are based on the results of studies and should be followed."

**Improve surface and subsurface drainage.**

"Certain diseases, such as pythium blight, generally develop in low areas of a lawn where water tends to collect and the soil stays too wet. One good way to improve the drainage is by installing drainage tile or pipe to get the water to move out of the soil."

Just the opposite problem occurs in areas where water is running off and not penetrating the soil. "Frequent aerifying, two or three times a year, is one of the best ways to improve this situation. Get those holes in the lawn so the water will penetrate and not run off."

**Maintain soil pH between 6 and 8.** "There are some diseases that are predisposed by low pH and others by high pH. For example: in the South we get much more brown patch in tall fescue on acid soils with a pH of 5.5 or less."

On the opposite end, studies have shown that summer patch and take-all patch are more severe when the pH is up around 8; Burpee believes the same is true for necrotic ring spot since it is caused by a similar fungus. "Use ammonium sulfate as the nitrogen source in the Fall to decrease soil pH," Burpee advised, adding that it takes a few years to reduce the pH this way.

Liming is recommended to raise the pH. "There are a lot of areas where turfgrass is grown on very acid soils. If lawn care companies checked soil pH on a more regular basis, they'd find that many of the lawns they are managing would probably require liming.

"It's difficult to do with turf because you can't cultivate the lime into the root zone. You're just applying it to the surface. If you aerify or verticut before or after the application, that can help get lime down into the root zone."

**Avoid soil compaction.** Use lightweight mowing and grooming equipment. Topdress and aerify as needed.

Reprinted with permission from *Turf*, May 1995.

**If you use fungicides, develop a plan.**

"Curative control only works in the early stages. With root diseases such as necrotic ring spot, by the time you see the above-ground symptoms it's too late to use fungicides. You need to use preventative control the next year."

When it comes to fungicide applications, lawn care businesses have a unique problem, according to Burpee. "When you look at most fungicides that are registered for turf, the label generally says to apply it every 10, 14 or 21 days."

"That's fine for a golf course and maybe even a very diligent homeowner. But it's a problem for a lawn care company that can only show up every five or six weeks to be economical. The studies that really need to be done for the lawn care companies are studies in which fungicides are applied on a five- or six-week schedule to see if they give acceptable control at those intervals."

In Georgia, researchers have done some work on brown patch in tall fescue with fungicide applied every six weeks, not 14 days. "We approached getting acceptable control. This means there are probably other fungicides out there, for other diseases, that will do the same thing. We just need the experimental results."

With home lawns, it's not as crucial for fungicides to control the disease at 100 percent, according to Burpee. "Generally, a home lawn can withstand a little bit higher threshold of disease than, let's say, a golf green. So even if you have 10 percent disease in a lawn, that may be acceptable if you've reduced it from 60 percent down to 10 percent. Fungicides are not under as much pressure to give 100 percent control as they are in a golf situation."

## **FACTOR - A NEW PREEMERGENCE HERBICIDE FOR NURSERY PRODUCTION**

**Jeffrey F. Derr, Associate Professor  
Virginia Polytechnic Institute and State  
University**

Factor contains the active ingredient prodiamine, which is also sold under the trade names Barricade and Endurance. All three formulations are a 65% water dispersible granule (sprayable formulation) of prodiamine. Barricade, the first product introduced, is sold primarily for crabgrass and goosegrass control in turf. Landscape ornamentals were later added to the Barricade label. Factor is the formulation registered for use in container and field nurseries. Endurance is being promoted primarily for noncrop weed control (highway guardrails, parking lots, storage areas, etc.)

Prodiamine is a preemergence herbicide with no activity against emerged weeds. It is member of the dinitroaniline herbicide class, the yellowish-orange chemicals that include Surflan, Treflan, and Pendulum, among others. Prodiamine, like the other compounds in this group, is a root inhibitor and is primarily effective against annual grasses and small-seeded annual broadleaf weeds. Factor will not control perennial weeds or annual broadleaf weeds such as eclipta, common groundsel, sowthistle, common ragweed, or annual morningglory.

In my studies, prodiamine has provided good control of large crabgrass, prostrate spurge, yellow woodsorrel, carpetweed, and common chickweed. In many instances it will make sense to combine Factor with a broadleaf herbicide such as Princep, Gallery, or Goal.

One of the advantages of prodiamine is its very low water solubility, meaning that it has little potential for leaching. However, the other

dinitroaniline herbicides also possess low water solubility, although not quite as low as prodiamine. Pound for pound, prodiamine has perhaps the longest soil residual of the dinitroaniline herbicides. Factor is applied at lower use rates (0.75 to 1.5 pounds active ingredient per acre) compared to the other dinitroaniline herbicide like Surflan (application rates of 2.0 to 4.0 pounds active ingredient per acre). However, in my studies, a two or three quart rate of Surflan has given similar, and in some cases better annual broadleaf control, than the lower use rate of prodiamine

Factor should be looked at as an alternative to Surflan or Pendulum. One should expect a similar weed control spectrum for these three herbicides since they are quite similar chemically. Combining Factor with other herbicides will broaden the spectrum of control. Tolerance of herbaceous and woody ornamentals to prodiamine has been very good in my trials.

Reprinted from *VNA Newsletter*, March/April 1995.

## **ARE YOU GETTING THE BIGGEST BANG FOR YOUR ADVERTISING BUCK?**

**Russ Powell - Extension Agent, Business Management**

Are you getting the most out of your advertising dollar? There are many "how to" or cookbook advertising schemes and many pushy sales people. Unfortunately, no one "recipe" will work for everyone in every situation and it is easy to fall prey to a fast-talking sales representative.

Before you analyze your advertising program, you must:

- Know your goals...both personal and business.
- Know your customers and what they want.
- Know the most effective way to reach your customers.

Keep in touch with current customers to learn how satisfied they are and to ask how you can improve. Correct any problems immediately. Not only will this make the customer happy, but it can help you avoid similar problems in the future. A happy customer is the least expensive and best advertising in the world. However, don't neglect those customers that are less than pleased with your services. Studies have shown that a satisfied customer may tell three or four friends, but a dissatisfied customer will tell at least ten people. To just maintain your market share, you must have at least two or three satisfied customers for every dissatisfied one.

Survey potential customers to learn about their needs and wants. Even if they are not a current customer, they are likely to remember that you cared enough to ask what they thought and wanted.

Remember that employees are your link with customers. They must understand your goals and

strategies. When employees do not understand why certain policies and practices are important, they may not adhere to, or support them.

There are many methods of advertising, each with specific benefits and limitations. Carefully evaluate the options and effectiveness within your market.

### **Newspaper**

Newspapers are an authoritative source of information with wide coverage and ample room for copy. Advertising costs will depend on the size of the newspaper and circulation. In general, those who read newspapers have above average incomes and educational levels. Note that newspapers are quickly out of date and that there is a diminishing readership and a lack of appeal to younger people.

### **Radio**

This media has selectivity, flexibility, cost efficiency and personal identification. Costs vary with the station, time of day and amount of contract. Costs per ad decline as the number of spots increases. If you choose radio, you must be extremely careful to select a station with a format likely to appeal to your targeted client. Despite radio advertising claims, return is likely to be quite low, especially in a market with many stations.

### **Direct Mail**

You are able to control exactly who is targeted with direct mail and have a certain amount of flexibility in space and format. It is expensive relative to other forms of advertising on a cost/thousand basis. Often regarded as "junk mail," your advertisement may be discarded without being read, while there is a greater chance of a newspaper advertisement being read.

## Signs and Uniforms

Signs along heavily traveled roads are seen by a large number of people at a relatively low cost. However there is limited market penetration because of a limited number of suitable locations. Signs on trucks and at job sites work well because of low cost and more widespread visibility. Potential clients passing a job site are also likely to notice a crew in uniforms or at least T-shirts featuring the company name and phone number. Truck signs and uniforms can also create public goodwill - provided that drivers and crew members conduct themselves in a courteous and professional manner.

## Telephone Yellow Pages

As with radio advertising claims, beware of the salesperson armed with volumes of statistics about the number of people who use the yellow pages. Many people do use the yellow pages to find a conveniently located store or company name they recognize. But this is after they have decided to buy. Yellow page advertisements are not effective for encouraging people to buy. Their purpose is to sell those people who have already decided to buy on your company. In a market area covered by several different phone books, advertising can become quite expensive. Consider reducing the size of your advertisements. Most likely you will not find a decrease in the response.

## Customer Referrals & Coupons

Combining the power of word-of-mouth advertising with an incentive can be the very effective and not any more expensive than other forms of advertising.

Calculate the average cost of attracting a new client and then offer a current client a coupon for a discount off future work for each new client they refer to you. Just make sure the dollar value

of the coupon is less than the cost of attracting new customers in other ways. This can also encourage repeat business and promote goodwill. At the very least, you should send the customer a "thank you" whenever they refer new clients to you.

## Analyzing the Effectiveness & Efficiency of Advertising

- Ask how customers learned about you.
- How much money did you spend on each advertising medium?
- Calculate the advertising cost per customer for each medium used.
- Track the size of the sale by customer and medium.
- Calculate your average gross return on advertising for each medium.

$$\frac{\text{average sale}}{\text{ave. cost of recruiting customer}} = \text{ave. gross return}$$

Repeat this calculation for each advertising medium used.

- Calculate your average net return on advertising for each medium:

$$\frac{\text{ave. net return (profit)}}{\text{ave. cost of recruiting customer}} = \text{ave. net return}$$

Repeat this calculation for each advertising medium used.

Compare the results for each of the different mediums that you use to see what is currently working best for you and consider this information when making adjustments to your advertising campaign.

Reprinted from *Green Business Reporter*,  
Southeast Extension Region, April 1995/Vol:7,  
No.:2.

## **UPDATE AMERICA YIELDS SURPRISING RESULTS**

A quarterly poll of national opinion, Update America, was conducted by KRC Research and Consulting for the Bozell Worldwide Advertising Agency. This recent survey disclosed several interesting discoveries about plants and gardening.

This data was based on a national survey of 1,000 adults conducted from January 27-31, 1995. The margin of error for the sample was +/-3%.

Only 10% of Americans stated that they know about the value of plants and gardening. Only 1/3 of those polled believed they were somewhat knowledgeable on the subject despite the fact that gardening ranks as most American's #1 favorite pastime. Women outranked men as indicating that they know more about this outdoor activity.

Those interested in learning about this outdoor activity revealed their sources for information. Both men and women looked toward several resources with the majority of people looking to magazine articles, then friends, then store personnel and finally books. Keep in mind, though, that some of those surveyed reported that they did not go to a specific source for gardening information.

70% of those surveyed did indicate that the overall reason for plant purchase is "appearance." Also, surprisingly, under 10% believed that plants add value to a home. According to many realtors, good landscaping including trees, shrubs and flowers can not only improve the appearance of a home; but can add significant resale value.

When asked to rank the reasons for not purchasing plant materials, the majority of those surveyed answered that it was too much work. Also, 27% of men and 26% of women said they

lacked knowledge about the subject while under 15% said that it was too expensive.

Thus, this survey revealed that the average American lacks knowledge about the benefits of gardening. Many do not realize that plant material can increase the value of their homes. With the majority of people turning to magazines for information, several people can be educated by using only one main source. So educate consumers about the benefits of purchasing plants and gardening materials. If we can educate people, we can change America's buying patterns!

Reprinted from *Keeping Posted*, May, 1995/The Southern Nurserymen's Association, Inc./Volume 25, No. 3.

## **GARDEN COUNCIL PROMOTION ORDER SURVEY RESULTS**

The Garden Council announced the results of the Plants for America promotion order survey that was conducted by Ernst & Young LLP during March 1955: 85 percent of the grower respondents voted against a national promotion order.

Of the 35,888 growers surveyed by mail or fax, 7,141 responded to the ballot, a 20 percent response rate. Overall, 68 percent of respondents had prior knowledge of Plants for America. A total of 8,796 ballots were returned to Ernst and Young. However, 585 were returned for invalid address and 237 were returned after March 24, 1955. There were 833 invalid ballots which included non-growers, growers of an invalid industry segment such as cut flowers, fruit and vegetables, those who did not vote and respondents that photocopied the ballot. Interested parties may receive the survey's raw data including state reports for a contribution of \$50 - \$150 (depending on data requested).

The Garden Council will discontinue all Plants for America promotion order efforts. The Council will review its charter and mission concerning national advertising and will comply with the directives of its supporters and members.

**RESEARCH AND PLANT  
INTRODUCTIONS FROM MT. CUBA  
CENTER FOR THE STUDY OF  
PIEDMONT FLORA**

**Richard Lighty, Mt. Cuba Center,**

Adapted from a presentation at the 1994 Annual Meeting of the Eastern Region of The International Plant Propagators' Society, Dec, 1994.

Mt. Cuba Center for the Study of Piedmont Flora, located in Greenville, DE, is a privately owned research center. The goals of the center are to study plants native to the piedmont area, and to develop easy to propagate, stress-tolerant plants with public appeal. It is open to the general public for arranged tours, but maintains a focus on research, conservation, and education. The following is a brief summary of research at Mt. Cuba.

Propagation research, headed up by Jeanne Frett, is concerned with perfecting propagation and production methods for plants that are not now produced in nurseries, and are customarily collected from the wild. The new Federal Trade Commission regulations require that wild-collected plants be so labelled when offered for sale. As a result, this will give those who propagate a market edge with educated consumers who will not knowingly buy wild-collected plants. We are presently working on the propagation of *Trillium grandiflorum* from seed and by division. We already have data that indicates marketable *Trillium* can be produced from seed for less than one dollar per plant. We expect to publish on this within the next three years. The asexual propagation study is based on "fast propagating" or "clumping" forms such as *T. grandiflorum* "Quicksilver". These forms lack the usual inhibition of secondary buds on the main rhizome, characteristic of most individuals of the species. Preliminary studies indicate that such

forms might be commercially produced for around two dollars a plant.

In addition, we are working on the production of native, terrestrial orchids in a way that would prove economically viable for commercial producers. Several independent developments with these traditionally difficult plants may prove mutually supportive. There are a number of workers who are hybridizing the lady's-slipper orchards (*Cypripedium* spp.) and, if other ornamental plants are any guide, the variation that results from hybridization will not only include many beautiful new colors and forms, but will also be reflected in broader tolerance to environmental differences that should lead to greater garden adaptability. At the same time some *in vitro* propagators of orchids are now routinely able to produce plantlets of some *Cypripediums* for sale. True, the price is still on the high side, but as we know from other technologies, once the major breakthrough has been made, smaller technological advances and economic competition will bring that price down. At Mt. Cuba Center we are directing our efforts toward production of salable plants from these small plantlets, and so far our results have been encouraging. We do not expect commercially-propagated and grown plants of lady's-slipper orchids to be sold in retail garden centers for many years, but progress is being made.

The remaining research focus is on identification and evaluation of superior native plants. Selections from Mt. Cuba are tested extensively before they are released as plant introductions. We have been gratified by the reception that our early introductions have received in the trade and from the homeowner. *Solidago* 'Golden Fleece' and *Aster* 'Purple Dome' both received the top award of the International Stauden Union in 1994. The ISU is a world-wide association of perennial growers that runs trials on all newly named cultivars. We interpret this as an indication that we are meeting our original goal: to release only tough, stress tolerant plants with

wide public appeal and no propagation or production difficulties. The following is a list of plant introductions to date, so you can see what is making its way into commerce.

Plant Introductions from Mt. Cuba Center:

***Cornus sericea* 'Silver and Gold'** - 1988; originated as a sport of *C. sericea* 'Flaviramea' at Mt. Cuba, Greenville, Delaware. Leaves distinctively white variegated, other characteristics the same as 'Flaviramea'. Distributed widely to I.P.P.S. members, Cullowhee Conference registrants, various nurseries around the country, and to local plant sales and auctions. Published in *The Public Garden*, Vol. 3, No. 2; January 1988 and publicized as a replacement for variegated forms of *Cornus alba* in the hot and humid region and southward. Available from Centerton Nursery, Inc.; Crownsville Nursery; Earth Shade Nurseries; Forestfarm; Hanging Dog Valley Nursery; Klehm Nursery; Niche Gardens; North Creek Nurseries, Inc.; Roslyn Nursery; Sunlight Gardens; Swallowtail Garden and Nursery; and Wayside Gardens. Cultivar registered in 1988.

***Aster laevis* 'Bluebird'** - 1955; found in a private garden in Guilford, Connecticut, where it had appeared as a volunteer seedling, this cultivar differs from the typical species in its freedom from mildew and other foliage diseases. It reaches four to five feet in height with gracefully arching stems bearing masses of one-inch lavender-blue flowers with yellow centers. 'Bluebird' responds well to fertilization and good growing conditions, but is broadly tolerant of soil types and will grow in full sun or moderate shade. Available from North Creek Nurseries, Inc.

***Aster novae-angliae* 'Purple Dome'** - 1989; noted along Pennsylvania Route 100 below Allentown, PA. Material provided to Mt. Cuba Center by Robert G. Seip of Lennilea Farm. Evaluated under diverse garden conditions; publicized as the most compact form (18" tall x

36" wide) of the species; does not expose its foliage to view, so lack of resistance to foliar problems is not of concern. Registered in 1989. Written up in *Fine Gardening* magazine Vol. 25; May-June 1992. Widely offered nationally in mail order catalogs and distributed locally through plant sales, etc. Available from Bluemount nurseries, Inc.; Busse Gardens; Centerton Nursery, Inc.; Crownsville Nursery; Dunvegan Nursery; Holbrook Farm & Nursery; Ingleside Plantation Nurseries; Mileager's Gardens; Niche Gardens; North Creek Nurseries, Inc.; Quality Nurseries; Roslyn Nursery; Russell Gardens; Sunlight Gardens; Sunny Border Nurseries, Inc.; We-Du Nurseries; White Flower Farm; Wild Earth Native Plant Nursery; and Andre Viette.

***Heuchera americana* 'Garnet'** - 1989; selected in 1984 from a variable group of colored-leafed *H. americana* growing at Mt. Cuba, Greenville, Delaware. Original-selections made by Marcie Weigelt, evaluation and final selection by R. W. Lighty. Tissue cultured in 1985 for wide evaluation under diverse conditions and distributed in 1989 to nurseries around the country. Registered in 1989; see *American Horticulturist* 10 December 1992 or *Perennial Plants*, Vol. XXV; winter 1991. Available from Busse Gardens; Mileager's Gardens; North Creek Nurseries, Inc.; SMK Plants; and Van Berkum Nursery.

***Solidago sphacelata* 'Golden Fleece'** - 1989; discovered in 1985 as a spontaneous seedling in a garden in Eden, North Carolina. Identified in 1986. It was evaluated under diverse conditions at Mt. Cuba Center and determined to be a low, compact form of the species suitable for groundcover use. Registered and distributed 1989. Won the Internationale Stauden-Union's Award for an outstanding new plant in Switzerland in 1994. Available from Bluemount Nurseries, Inc.; Busse Gardens; Carroll Gardens; Centerton Nursery, Inc.; Crownsville Nursery;

Dunvegan Nursery; Forestfarm; Gartnerrei Hugin (Germany); Holbrook Farm & Nursery; Ingleside Plantation Nurseries; Klehm Nursery; Niche Gardens; North Creek Nurseries, Inc.; Plant Delights Nursery; Quality Nurseries; Springbrook Gardens, Inc.; Sunlight Gardens; Sunny Border Nurseries, Inc.; Andre Viette; and Wild Earth Native Plant Nursery.

***Leucothoe axillaris* 'Greensprite'** - 1991; one of twelve clones of *Leucothoe axillaris* found and selected at Mt. Cuba in 1983. Evaluated for ease of propagation and for ability to quickly grow to salable size and quality under field nursery conditions. Registered in 1991. Publicized as a solid green leucothoe with narrow leaves with undulating edges and attenuated tips. Its light catching ability is spectacular and its stiffly arching stems give it a graceful and elegant character. See American Nurseryman 15 February, 1991; p. 41. Distributed to nurseries, universities, public gardens, and horticultural research stations nationally and internationally. Not yet available.

***Pachysandra procumbens* 'Forest Green'** - 1992; originally obtained from the teaching garden at Pennsylvania State University in 1952. This clone has been heavily propagated by the introducer and distributed to friends, nurserymen, and others. It has been observed and evaluated for overall ornamental quality in several different gardens in the Middle Atlantic region and at a number of sites within some of those gardens. Its "surface" as a groundcover is more smoothly undulating than the five other clones with which it has been compared, and the leaf whorls are larger and more regular than most of these. Leaf-mottling is not as prominent as in several other clones. Registered 1992. Available from Conard-Pyle Co., and North Creek Nurseries, Inc.

***Trillium grandiflorum* 'Quicksilver'** - 1992; originated in the wild, in Northeastern Pennsylvania in 1958; observed and evaluated in many sites for rapid increase. Distributed locally

to individuals, nurseries, non-profit plant sales, etc.; stock plants have gone to nurseries in several states. This clone has a doubling time of approximately 1 year. For ornamental qualities, it is similar to the species. Registered 1992. Not presently offered for sale.

Reprinted from *Landscape Plant News*, Vol. 6, No. 1, Spring 1995

## PESTICIDE NEWS

### Insecticides:

ETHION 4E and ETHION 8E - Micro Flo Co. - two ethion insecticide-acaricides, have deleted use on turf and ornamentals from their labels. Ethion 4E has also dropped its use on Bermuda grass. FMC Corp. dropped all ornamentals from its formulation of ethion in 1994.

GARLIC BARRIER - Garlic Research Labs - A garlic-based insect repellent has received EPA approval for use on plants, trees and vine crops. Product has low application odor and is available in 1-, 5- and 55-gallon containers and is designed for spray application (including in overhead mist lines).

MOCAP 10G (ethoprop) - Rhone Poulenc - Due to the high cost of re-registration, the company has deleted from their label all usage's on turf except golf courses.

DEMON (cypermethrin) - Zeneca - Added to their label the control of boxelder bugs, earwigs, carpenter ants, ticks and wood infesting beetles.

PIRATE (pyrrol) - American Cyanamid - EPA granted an experimental permit to use on 150 acres of greenhouse and shadehouse ornamentals to control various pests. Authorized in 31 states including DE, MD & PA.

VENDEX (fenbutolin oxide) - DuPont - All ornamental usages have been deleted from the label.

X-GNAT (nematodes) - Biosys - Packaged as a water-dispersible granule formulation, this nematode-based fungicide is now available to control fungus gnat larvae in greenhouse and nurseries. This product uses the beneficial nematode *Steinernema feltiae*, which is designed to enter the gnat larvae and kill the host. The

EPA has exempted beneficial nematodes from normal registration requirements, so there is no restricted-entry interval for this chemical.

PINPOINT 15G - (Valent USA Corp) - is a new formulation of the company's acephate insecticide. Pinpoint 15G is registered for ant, aphid, azalea lacebug and mealybug control on turf and noncrop areas.

2-4D, 2-EHE Gel - (Rhone-Poulenc Ag Co.) - Is the name of a new gel formulation of 2,4-D. The product, the first of its kind, has received EPA registration.

### Fungicides:

ALAMO (propiconazole) - Ciba - EPA has approved higher rates for application through pressurized injection equipment to ornamental trees to control oak wilt and Dutch elm disease. The rate has been increased from 6ml to 10ml for curative treatment.

MANZATE 200 (mancozeb) - DuPont - Deleted from their label the usage on flowers, ornamental uses and foliage plants.

PROTECT T/O (mancozeb) - Cleary Chemical Co. - New labeling includes turf applications plus horticultural sites including field, nursery, greenhouse and landscape. Also included on the label are 27 different diseases on 150 new plant species. The product can also now be applied by chemigation

ARMICARB (potassium bicarbonate) - Church & Durght - EPA approved an application to register this new active ingredient for formulation use with fungicides for plant disease control on flowers, ornamentals, turf, fruits, vegs and field crops.

### Herbicides:

PATHFINDER II (trifloprymethyl ester) - Dow Elanco - A new formulation developed for the control of woody plants in forests, industrial sites, non cropland and rangeland.

FLOREL - Lawn and Garden Products Inc. - Is a plant-growth regulator effective against parasitic mistletoe. Florel acts by causing the abscission of mistletoe shoots on infected trees and preventing its spread to other trees.

**Other:**

The following Worker Protection Standard changes were effective on May 11:

1. Certified private applicators must make a record of restricted-use pesticide applications within 14 days of application (previous time period was 30 days).
2. A “spot application” is any application made in the same day in a total area less than 1/10 acre. Spot application records must now include a concise description of the location and treatment.
3. The record information provided to an attending licensed health care professional will now also be available to individuals acting under the direction of that professional for the purposes of treating those who may have been exposed to a restricted-use pesticide.

The following new publications are available in the Country Extension offices:

*Pesticide Recordkeeping is more than just a good idea--It's the Law.*

*A Guide to Heat Stress in Agriculture*

*How to Use Respirators in Compliance with EPA's Worker Protection Standard & OSHA 29CFR 190.134. A Guide for Agricultural and Horticultural Employers.*

## RESEARCH BRIEFS

### Propagation:

#### **Enhanced Geranium Cutting Propagation with the Fungus *Trichoderma harzianum*.**

*Trichoderma harzianum* (isoate T-12) is a fungus that controls soil-borne pathogens and can enhance growth of several vegetable and floricultural crops. Addition of T-12 to rooting medium of difficult-to-root chrysanthemum ('Dark Bronze Charm' and 'Golden Bounty') increased growth relative to the control. There were no detectable difference in easy-to-root cultivars ('Davis' and 'White Marble'). (A. J. MacKenzie, T.W. Starman and M.T. Windham)

**Grafting 'Whitespire' Japanese Birch on Other Birch Rootstocks.** Under certain conditions, growth of 'Whitespire' birch can be enhanced by grafting this cultivar on rootstocks of other species, including European and river birch. (T.G. Ranney and E.P. Whitman, II)

(Previous two articles excerpted from *HortScience*, Vol. 30(3), June 1995.

### Field Production:

**Harvest Date and Storage Quality of Herbaceous Perennials.** Five species of herbaceous perennials were harvested between September and December. Plants from later harvests were of higher quality than those from earlier harvests, showing higher rates of survival after longer storage periods, less mold development in storage and stronger regrowth after storage. Late field harvest is recommended for optimum storage quality. (A.M. Hanchek and A.C. Cameron)

(Previous article excerpted from *HortScience*, Vol. 30(3), June 1995.

### Container Production:

**Root Distribution of *Ilex cassine* in Copper-treated Containers.** There are fewer fine roots and no coarse roots (> 5mm) in the outer 1 cm of the rootball of plants grown in containers treated with copper hydroxide. Fine roots inside the rootball did not replace the fine roots lacking in the outer cm. By eliminating circling or girdling roots, copper-treated containers produce plants that are more easily established in the landscape. However, lack of roots at the periphery of the rootball might increase water stress for a short time following planting until roots grow into landscape backfill soil because few roots are in intimate contact with the backfill soil. Further research is needed in this area. (E. F. Gilman and R.J. Beeson)

(Previous article excerpted from *HortTechnology*, Jan./Mar. 1995 5(1).

#### **Foliar Diseases of Common Periwinkle.**

Although some of the fungicides tested suppressed disease symptoms, no fungicide eliminated the foliar diseases in actively growing plants. Thiophanate methyl/mancozeb and propiconazole used in rotation with thiophanate methyl/mancozeb as preventative treatments were the most effective in reducing disease symptoms. In addition, using 'Bowles' and other more resistant cultivars also may reduce disease severity and result in less need for fungicide use in periwinkle production. (M.C. Koelsch, J.C. Cole and S.L. vonBroembsen)

(Previous article excerpted from *HortScience*, Vol. 30(3), June 1995.

### Greenhouse Production:

**Effects of Hydrophilic Polymer and Wetting Agent on Growth and Shelf Life of Impatiens.** Hydrophilic polymers (SuperSorb and Soil Moist) and the wetting agent (AquaGro-G)

provided no growth advantage for *Impatiens wallerana* 'Accent Red' grown in either peat : perlite : vermiculite (PPV) or bark ; peat ; perlite (BPP). In PPV the use of this formulation of AquaGro-G was detrimental to the growth of impatiens. (A.M. Blodgett, D.J. Beattie and J.W. White)

(Previous article excerpted from *HortTechnology*, Jan./Mar. 1995 5(1).

**Caladium Height Control with Paclobutrazol Drench Applications.** Commercially acceptable height control was provided by paclobutrazol drench treatments at 0.5 and 1.0 mg/pot applied 3 weeks after planting. (J.E. Barrett, C.A. Bartuska and T.A. Nell)

(Previous article excerpted from *HortScience*, Vol. 30(3), June 1995.

#### **Weed Control:**

**Influence of Mulch on Turf Herbicide Injury to Landscape Trees.** Four species - 'Bradford' callery pear, crape myrtle, Eastern redbud and red maple - were used. Five herbicides - Banvel (dicamba), BAS 514 OOH (quinclorac), Image (imazaquin), Redeem (triclopyr) and Stinger (clopyralid) - were tested. In general, mulch (pine bark, hardwood bark or pine needles) reduced herbicide injury. The rate of injury and most damaging herbicide were species specific. (L.J. Smith and W.A. Skroch)

**Chopped Newspaper Mulch for Weed Control in Nursery Crops.** Chopped newspaper mulch provided acceptable weed control in nursery row crops. The higher mulch rate (6 inch depth) resulted in weed suppression for two seasons and showed little decomposition by May of the third season. Rolling the wetted paper after application provided a dense uniform mat that appeared to resist weathering and blowing by wind. Further reduction in blowing of paper mulch was

achieved by applying a tackifier after rolling. (N. E. Pellett and D.A. Helba)

**Granular Preemergence Herbicides in Bedding Plants.** Dimension (dithiopyr) and Snapshot (trifluralin + isoxaben) were generally non-injurious to ageratum, celosia, impatiens and marigold while suppressing growth of basil (Snapshot only), begonia, nicotiana (Dimension only) and salvia. No herbicide evaluated was safe at all rates on all annuals. (M. Thetford, C.H. Gilliam and J.D. Williams)

(Previous three articles excerpted from *J. Environ. Hort.* 13(2), June 1995.)

#### **Landscape:**

**Four Compaction Remediation Methods for Landscape Trees.** When planting in heavily compacted soils around newly constructed buildings or in urban areas, tree establishment may be problematic. Based on this study, the following recommendations regarding planting practices may be made:

- When considering planting or remedial techniques for compacted soil, primary consideration should be given to reducing mechanical impedance rather than improving aeration. Drainage should be installed where necessary.
- Soil trenches (four trenches radiating out from the planting hole, dug with a mechanical trencher and filled with Arkport sandy loam soil; 5 inches wide, 1 foot deep and 2 feet long) may be helpful as a remedial treatment for trees showing poor establishment where compacted soil is the suspected cause. For that matter, any practice that increases the volume of easily penetrable soil would be expected to yield improved tree establishment and growth.
- The practice of amending backfill with sphagnum peat may be useful under

conditions such as those in this study (i.e. compacted, inhospitable native soil with adequate moisture and drainage).

- The installation of surface vertical sump drains away from the planting hole for aeration purposes does not warrant the expense. At best they offer no benefit, and may, in fact, be detrimental to tree growth. (S.D. Day, N.L. Bassuk and H. van Es)

**High Root-zone Temperatures and Their Effect on Maples.** Plants grown in containers in the nursery or at urban planting sites experience high root-zone temperatures. Growth was impaired for all plants tested at 97 F but cultivars differed in the extent to which 93 F affected stem elongation, dry mass, transpiration and leaf chlorophyll content. ‘Autumn Flame’ and ‘Schlesinger’ red maple and ‘Jeffersred’ Freeman maple were relatively resistant and ‘Franksred’ red maple and ‘Indian Summer’ Freeman maple were relatively sensitive to high root-zone temperatures in greenhouse trials. (L.C. Wilkins, W.R. Graves and A.M. Townsend)

(Previous two articles excerpted from *J. Environ. Hort.* 13(2), June 1995.)

#### **New Releases:**

‘**Patriot Elm**’ is a hybrid elm released by the U.S. Department of Agriculture. It is disease-resistant and insect-tolerant. ‘Patriot’ elm has a moderately vase-shaped crown, similar to a more uptight American elm. It is easily propagated from softwood cuttings taken in the spring or early summer, dipped in 0.8% IBA and placed under intermittent mist in a mixture of peat:perlite (1:1 by vol.) or other similar medium. The U.S. Department of Agriculture released ‘Patriot’ in 1993. A few wholesale nurserymen are propagating and growing liners of this new cultivar for future sale. The U.S. National Arboretum can supply a limited number of bud sticks or rooted cuttings to nurseries, experiment

stations, arboreta, or other interested parties. Written request should be made to A.M. Townsend, U.S. National Arboretum, USDA-ARS, 3501 New York Avenue, N.E. Washington, DC 20002. (A.M. Townsend, R.W. Hall and W.O. Masters)

(Previous article excerpted from *J. Environ. Hort.* 13(2), June 1995.)

‘**Ruby Mist**’ Coralbells. Plants form small mounds and have basal leaves that are rounded-cordate or broadly 5-9 lobed or toothed with long petioles. Small flowers are borne in panicles on slender scapes overtopping the foliage. ‘Ruby Mist’ plants bloom more consistently and have shorter, stronger flower stalks than other cultivars. ‘Ruby Mist’ is registered with the international authority for herbaceous perennials and the Canadian Ornamental Plant Foundation (COPF), 652 Aberdeen Ave., North Bay, Ont. P1P7H9, Canada. Limited amounts of propagating stock are available until 1996 to members of COPF upon request to L.M.C. Agriculture Canada will collect royalties from this cultivar. (L.M. Collicutt)

Previous article excerpted from *HortScience*, Vol. 30(3), June 1995.

#### **AWARD WINNERS FOR 1996!**

The Perennial Plant Association has named *Penstemon* ‘Husker Red’ as the 1996 perennial plant of the year. ‘Husker Red’ is grown primarily for its striking lance-shaped foliage with maroon-red color and season-long interest.

The All-America Rose Selection winners for 1996 are:

‘Carefree Delight’ - clusters of up to 10 buds, open to expose carmine-pink petals with white centers.

'Livin' Easy' - a floribunda with ruffled apricot orange blooms with 22-28 petals per flower.

'St. Patrick' - Novel chartreuse buds unfurl slowly to reveal a yellow-gold flower.

'Mt. Hood' - ivory-white petals.

All-America Selection winners for 1996 are:

Petunia 'Heavenly Lavender' - improved, double multiflora petunia with lavender blooms.

Petunia 'Fantasy Pink Morn' - petite pink blooms.

*Salvia farinacea* 'Strata' - bicolor blue and white flower: the calyx is white and corolla is blue.

William Cooper  
City of Dover]  
P.O. Box 475  
Dover, DE 19903

## **WELCOME NEW MEMBERS**

### **Active Members**

R & L Enterprises, Inc.  
P.O. Box 63  
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(302) 856-3017  
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D & L Grower Supplies, Inc.  
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Leola, PA 17540-0241  
(717) 656-0809  
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The Ivy Farm, Inc.  
P.O. Box 114  
Locustville, VA 23404  
(804) 787-4096  
Meriwether Payne, Richard Davis

### **Individual Members**

**New Guinea Impatiens: A Ball Guide**, edited by Warren Banner and Michael Klopmeier, \$49 prepublication price, \$55 regular price - item #B024/**Diseases of Annuals and Perennials: A Ball Guide** by A.R. Chase, Margery Daughtrey and Gary W. Simone, \$0 prepublication price, \$69 regular price - item #B025/**Ball Spanish Floriculture Dictionary** by Veronica Hoyos de Martens and M.L. Nydia Palma de Villarreal, \$60 prepublication price, \$86 regular price - item #B026. Prepublication prices end June 25, 1995. For more information phone 1-800-456-5380, FAX 1-800-456-0132.

**Greenhouse Engineering.** A revised edition written by extension specialists at the University of Connecticut. This 212 page text provides up-to-date information on planning, constructing, and controlling a commercial greenhouse. Also included is a list of greenhouse construction and supply companies and plans for greenhouses as well as topics on heating and cooling, and labor output. For more information and a free publication catalog-call (607)255-7654.

**New England Greenhouse Floricultural Crop Pest Management and Growth Regulation Guide.** Copies are \$10 each(postage included). To obtain a copy, send a check payable to the University of Connecticut at: Agricultural Publications, 1376 Storrs Rd., Storrs, CT 06269-4035.

**Guidelines for Planting Near Power Lines.** Available through Virginia Power/North Carolina Power. Brochure includes proper plant selection and placement around utility wires to minimize hazardous situations. Addresses current pruning methods in proximity to power lines, energy conservation through proper placement and planting methods to encourage successful tree growth. Booklet is free and will be available at upcoming horticultural and arboricultural conferences in 1995, or can be ordered by calling:1-804-775-5259.

**ALCA/NLA Operating Cost Study.** The report provides detailed financial results of landscape contractors. Provides resource information that enables landscape professionals to evaluate, plan and better manage their business. It is designed to help the three primary industry groups-exterior landscape construction, landscape management and interior plantscape. Available for \$25 for ALCA members/\$45 for non-members, +5 % for shipping/handling. To order, call: 1-800-395-2522, FAX:(703)620-6365.

**Hollies for the Landscape in the Southeast**, by Ken Tilt, David Williams, Willard T. Witte and Mary Kathryn Gaylor. This publication includes problems related to pollination of flowers, as well as sections on evergreen hollies, deciduous hollies and interspecific hybrids. Also included are sections on uses in the landscape and production and commercial operations. Cost is \$3.25 from the Alabama Cooperative Extension Service (or ACES), ACES Publications Dist., 6 Duncan Hall, Auburn University, AL 36849-5632.

**Field Notes.** The form, developed by ISA and the Council of Tree and Landscape Appraisers, is designed for use with the eighth edition of "The Guide for Plant Appraisal." The form is printed on a file folder, easy to follow and will aid the consultant in maintaining a record of the appraisal. Forms can be purchased for \$8 per set of 15 folders for both ISA members and non-members. Add \$5 shipping. For more information call: (217)355-9411, FAX(217)355-9516.

**IPMnet:** Access available on the Internet to electronic newsletters, databases and other information related to pest management. For more information, call the Consortium for International Crop Protection at Cornell University (315)787-2252, FAX(315)787-2276.

**1995 Cut Flower Book:** This book contains 651 individual photos of Holland top varieties and treatment information and data on those that are available in multiple colors.

**1994 Pot Plant ID Book:** This photo reference book contains individual sunlight, water, nutriment and misting requirements for each of 682 different varieties.

**1995-96 Garden Plant Book:** Provides 92 pages of information identifying the 394 most popular perennials, bedding and tub plants, shrubs, trees and conifers sold at the Netherlands auction. All three publications can be purchased through Public Relations Marketing, Inc. Contact Robert Perilla or Joan Hahn (516)621-3625 or FAX (516)621-3923).

**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 11-12** - 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** - Grounds Manager's /Arborists Field Day, Villanova University. Contact Scott Guiser (215)345-3283.

**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 12, 13** - Composting Seminar. American Soc. for Horticultural Science. Omni Inner Harbor Hotel, Baltimore, MD. Call:(703)836-4606 or FAX:(703)836-2024.

**July 20 to 22** - Cullowhee Native Plants in the Landscape Conference. Western Carolina Univ. Cullowhee, NC. Call:(800)928-4968 or FAX:(704)227-7115.

**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** - Penn Allied Nursery Trade Show. PA Landscape and Nursery Assn. Fort Washington Expo Center, Fort Washington, PA. Call:(800)898-3411.

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

**July 28** - Industrial and Right of Way Weed Control Meeting, Montgomery County 4-H Center. Contact Nancy Bosold, (610)489-4315.

**July 30 - August 5** - Perennial Plant Association Symposium, Radisson Hotel South, Minneapolis, MN. Contact: Dr. Steven Still, Tel:(614)771-8431, FAX: (614)876-5238.

**August 3-4** - Southern Nurserymen's Association Researcher's Conference/Trade Show. Res. Conf. **August 4-6** - Trade Show. SNA Contact: (404)973-9026.

**August 4-5** - 1995 American Conifer Society National Meeting, Asheville, NC. Call: (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 Teffeau, 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 10, September 13, October 3** - Plant Production Seminars. Contact Dave Suchanic (610)489-4315.

**August 13-16** - International Society of Arboriculture's 71st Annual Conference. Hilton Head Island, SC. Call:(217)355-9411, FAX:(217)355-9516.

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

**August 30** - Municipal Tree Restoration Workshop, MET ED Auditorium, Reading. Contact Julianne Schieffer, (610)489-4315.

**September 7, 14, 21** - Perennials for Professionals, Penn State Berks Campus. Contact Judith Schwank, (610)378-1327.

**September 10** - 2nd Annual Gardener's Plant Exchange to benefit Environmental Education. Sponsored by the Brandywine & Red Clay Valley Associations. Located at the Myrick Conservation Center, 6 miles west of West Chester & 3 miles east of Unionville. Exchange begins at 10:00 a.m. Further information call: (610)793-1090, FAX(610)793-2813.

**September 16** - D.A.N. Auction, Delaware Center for Horticulture. Contact Diane Hill, 239-4675.

**September 19, 21** - Pruning and Landscape Maintenance, Ornamental Short Course Series, Newark, DE. Contact Susan Barton, 831-2531.

**September 25, 27 October 2, 4, 9, 11** - Business Management, Ornamental Short Course Series, Newark, DE. Contact Susan Barton, 831-2531.

**October 2,9,14,16** - Propagating Perennials, Dale Hendricks at Longwood Gardens. Contact (610)388-1000, Ext. 516.

**October 9-13** - Tree Climbing School, PennState Delaware County Campus. Contact Rick Johnson, (610)565-9070.

**October 17** - Perennials Conference, Swarthmore College. Contact Pennsylvania Horticulture Society, (215)625-8250.

**October 19** - Nursery Bus Tour. Contact Dave Suchanic, (610)489-4315.

**October 20** - Native Plants in the Gardened Landscape, Rick Darke at Longwood Gardens. Contact (610)388-1000, Ext. 516.

**October 25** - Growers' School, sponsored by the Association of Specialty Cut Flower Growers, Inc. One-day Growers' School in conjunction with the ASCFG National Conference in Baltimore, MD. Attendance will be limited to 80. Registrations will be taken on a first-come, first-served basis, with ASCFG members receiving priority.

Contact the ASCFG at P.O. Box 268, Oberlin, OH, 44074, call:(216)774-2887, FAX(216)774-2435.

**October 28** - Wildlife Management Workshop, Bill Haldeman at Longwood Gardens. Contact (610)388-1000, Ext. 516.

**November 9** - DE/PA Garden Center Bus Tour, Three Maryland Garden Centers to view Christmas displays. Contact Susan Barton, 831-2531.

**November 10** - Pruning Workshop, Ed Broadbent at Longwood Gardens. Contact (610)388-1000, Ext. 516.

**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.

**November 15** - Delaware Turfgrass Conference, Hockessin Memorial Hall. Contact Marianne McGloin, 677-1895.

**December 1** - Native Plants in the Gardened Landscape, Rick Darke at Longwood Gardens. Contact (610)388-1000, Ext. 516.

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

**January 17, 18** - Delaware Horticulture Industry Expo, Sheraton Inn, Dover. Contact Marianne McGloin, 677-1895.

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

