

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

Happy New Year to everyone! I hope everyone has survived this terrible winter. Spring cannot come soon enough. Well, with one year under my belt, I'm ready to begin another exciting and growing year for the D.A.N.

I would like to welcome Craig Rice as our new D.A.N. president. Craig is the owner of Lakeside Greenhouses in Laurel, DE and has spent the past two years as vice-president. The board has changed since I came aboard. I would like to welcome the new members: Emmett Conte, DCC LTD, Newark, DE; Gerry Desmond, Jade Run Sod Farm, Bethel, DE; Chris Ashby, Carver's Lawn & Landscape, New Castle, DE; and David Coker, Green Seasons Lawn & Tree Care of Delaware, Dover, DE.

The Delaware Horticulture Industry Expo was a great success in January. Many attended our management and employee enrichment workshops. Exhibitors were happy with our attendance. The 1997 show committee has already met to prepare for next year's show.

The D.A.N. awarded its first grant from the Research & Education Fund to Steve E. Hastings and Rodolfo V. Tanjuakio from the Food & Resource Economics Department at the University of Delaware for the proposal entitled "The Delaware Nursery Industry: An Economic Profile."

The Certified Nursery Professional exam will take place on March 26. Presently we have thirteen people scheduled to take the exam. The next exam will be October 29, 1996. Our CNP list is growing. If you are not a Certified Nursery Professional, I encourage you to take the exam and also register your employees. It is

another great marketing tool to expand your business.

The 1996 Plant of the Year are *Echinacea purpurea* 'Bright Star' (purple coneflower) and *Viburnum nudum* 'Winterthur.' The full-colored flyers will be mailed to all members soon. We will begin the 1997 and 1998 Plant of the Year selection process shortly. Anyone willing to participate on the selection committee may call Naomi McCafferty (302-239-7719).

Craig Rice and I recently attended the Joint Finance Committee hearing for the Dept. of Agriculture. The Joint Finance Committee approved the additional Nursery Inspector position we have advocated for some time.

Recently the Board held a D.A.N. retreat at the Department of Agriculture to review bylaws, membership requirements and various goals and projects. Shortly members will be receiving bylaws updates, which need to be approved by the voting membership. I encourage everyone to read the changes and return your vote as quickly as possible.

The D.A.N. is working closely with the Department of Natural Resources and Environmental Control on a water contingency plan for New Castle County. Although we do not anticipate the same environmental conditions, we should have a plan in place for the next drought emergency.

The following is an excerpt of the Annual Business Meeting minutes and the treasurer's report.

Annual Business Meeting Minutes  
January 18, 1996

Call to order: Chris Valenti, President  
Approval of minutes: Minutes were approved by the membership.

Overview of D.A.N. activities: Chris Valenti spoke on the growing horticultural industry in Delaware. The industry generated over \$100 million in sales over the past year. He introduced the 1996 Plants of the Year and explained how this program will continue to expand in the future.

Election of officers for 1996: Chris presented the proposed slate of officers. A motion was passed to accept the new officers for the board.

Farewell board members: Craig Rice, 1996 President, presented plaques to our retiring board members. Awards were given to Dick Sterling, Diane Hill, Tom Ross and Rosemary Richardson. Diane encouraged employees to become more involved in the D.A.N.

AAN: Clint Albin, AAN representative, awarded Susan Barton with the 1995 AAN Extension Award. The D.A.N. nominated Sue in 1994 for this award. Congratulations, Sue!

Treasurer's Report

Checking account			
12.31/95	Balance	\$11,345.65	\$11,345.65
Education account			
11/30/95	Balance	\$ 7,314.94	
12/29/95	Interest \$	19.59	
12/29/95	Ending Balance	\$ 7,344.03	\$ 7,344.03
Money Market Account			
1/30/95	Balance	\$11,061.06	
12/29/95	Interest \$	29.63	
12/29/95	Ending Balance	\$11,090.69	<u>\$11,090.69</u>
			\$29,770.37

American District Telegraph Company (ADT) is providing a new benefit for D.A.N. members. ADT is offering to businesses, organizations, employees and their families a SAFEWATCH PLUS home security system which includes FIRE and the following intrusion protection: Plus control with battery backup, door or

window contacts, motion detector, interior sounder, keypad, smoke/heat detector, window decals and a yard sign. The cost is \$198 (\$100 less that normal market price). Monthly monitoring is \$24.95/month and optional monthly service/maintenance is \$5. For information, call 1-800-238-3009 and set up an appointment with an ADT Sales Representative.

Moon Nurseries (PO Box 482, Yardley, PA 19067; 1-800-803-TREE) have used containers and used poly house frames for sale.

28,000	1 gallon	@\$0.07
6,000	2 gallon	@\$0.10
2,500	3 gallon	@\$0.15
2,500	5 gallon	@\$0.20

10,000 1/2" galvanized steel poly house bows along with a pair of 3' galvanized steel ground sleeves 5/8" (in diam.). The bows are 14' wide at the base and 6 1/2' at the peak.

1-200 sets	\$5.00 each	(a set consists of 2
200 + sets	\$3.00 each	ground sleeves and 1 bow)

All the items are F.O.B. Yardley, PA. Prices are as is and include no labor.

Quote for the Quarter: *What is right is often forgotten by what is convenient.* Bodie Thoene, Warsaw Requiem (Bethany House)

Have a great spring! Marianne

**WELCOME NEW MEMBERS**

Active

Sam's Lawn Service  
15 Glenway  
Smyrna, DE 19977

**DELAWARE DEPARTMENT OF  
AGRICULTURE--PLANT INDUSTRIES  
NEWS**

**Randy Ciurlino, Sr. Entomologist  
Delaware Dept. of Agriculture**

The Delaware Dept. of Ag., Plant Industries Section is the unit of state government responsible for regulating the nursery industry within the state. This year there are two major efforts under way to improve the nursery certification and inspection program.

The National Plant Board in conjunction with the American Association of Nurserymen and others, has recently written and adopted the "National Plant Board Plant Quarantine, Nursery Inspection and Certification Guidelines." The intent of these guidelines is to promote greater uniformity among the plant health and regulatory programs of the various states.

In keeping with the National Plant Board's reform efforts, Plant Industries has rewritten two portions of the Delaware Code, Title 3 - Agriculture, Chapter 11 - Plant Pests and Chapter 13- Nurseries and Nursery Stock. Both of these law reforms are currently pending legislation.

Plant Industries has also received notification that our request for a full-time Nursery Inspector has made the Governor's recommended budget.

The significance of these two events is that Plant Industries will be able to deliver increased and improved service to our state's nursery industry.

If you would like further details on either of these subjects, please contact Donald Eggen, Plant Industries Administrator, Lynn Harrison, Sr. Entomologist or myself at 1-800-282-8685.

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

**New Course Offering:**

**Propagation and Culture of Wild Flowers  
(PLSC 267)**

Introduction to the growth and culture of herbaceous perennials native to the eastern temperate U.S. Topics to include: plant survival strategies, seed collection and treatments, propagation (by seeds, division, cuttings & tissue culture), and habitats. Two mandatory field trips.

**June 4 - August 6 (9:00 - 12:00, Tuesdays)**

**102 Fischer Laboratory Greenhouse**

**Instructors:**

**Jeanne Frett, Asst. to the Director, Mt. Cuba Center for the Study of Piedmont Flora, Greenville, DE**

**Dr. Sherry Kitto, Assoc. Professor, Plant & Soil Sciences, University of Delaware, Newark, DE**

**For further information, call Sherry Kitto  
(302-831-2534).**

**To register, call Continuing Education (831-2741 or for Southern Delaware, 855-1630)**

A number of Delaware nursery professionals attended the 1996 AAN Management Clinic in Louisville, Kentucky. It was a great program once again, with nationally-recognized speakers, forward-thinking presentations and plenty of time to share information and learn from fellow industry leaders. Attendance at this meeting is well worth the expense (not all that great with cheap air fares!). I will try to share a summary

of some of the good talks I attended for those of you who couldn't make it in the upcoming D.A.N. News issues.

So far the 1996 Ornamentals Short Courses have been a big success. Most of the classes have been very well attended. The late flyer mailing (a perennial problem around Christmas time) resulted in cancellation of the computer class but we plan to try that again next year since we've heard a lot of interest in the topic expressed.

Look for the following courses once your spring season calms down:

Session 2 (July - August):

Annuals, Bulbs and Grasses for the Landscape  
Perennials for the Landscape  
Diagnosis and Control of Diseases on Woody Ornamental Plants  
IPM in the Landscape

Session 3 (October - December):

Weed Control in Turf and Ornamentals  
Drafting Techniques for the Landscape Designer

The Department of Plant & Soil Sciences would like to thank the D.A.N. for their generosity in providing a recruitment scholarship of \$500. We have an excellent pool of students applying for acceptance in the Plant & Soil Sciences Department this year. We hope to attract and retain these excellent students by offering special scholarships to qualifying students. The D.A.N. board has requested that their \$500 contribution be allocated for a student from the Delmarva Peninsula. The award and sponsoring organization (D.A.N.) will be listed in the Honors Day program next spring.

Some D.A.N. members participated in a focus group activity for the Plant & Soil Sciences Department in December. We asked ten prominent industry members and ten recent (within the past ten years) graduates of the Plant

Science program to discuss a proposed landscape horticulture curriculum. The groups generated a variety of great ideas and supported the formation of two new majors in the Department of Plant & Soil Sciences. The faculty recently approved two majors: Plant Biology and Landscape Horticulture. The next step is to develop specific curricula for both majors. We view this as a step towards making our curriculum more appropriate for the industry today. We value your input and hope we will create a program that produces the industry leaders of tomorrow.

Once again, Gary Smith and I are teaching an exciting undergraduate class. This year, the class is called urban horticulture and we are working with the Delaware Center for Horticulture (DCH). Students have just completed an action plan to be used by DCH for the development of community gardens. They will soon begin a design project for the DCH parking lot and will finally develop an educational exhibit on urban horticulture. This type of course provides a capstone experience for students. They bring together information they have learned in other courses and apply it to real world problems. We will keep you posted on this and other courses we are teaching that might interest you. Suggestions are always welcomed!

The fourth annual University of Delaware Botanic Gardens (UDBG) Benefit Plant Sale is scheduled for April 19 and 20 at the Fischer Greenhouse on the University campus. Preorder catalogs are available now and order forms are due March 31. To receive a catalog or order form, call Dot Milsom (302-831-2531). This sale has two primary goals. The first is to raise money to fund student internships in the UDBG that provide students with real landscape management experience. The second is the introduction new plant material to the general public. We know you can't grow plants for

which there is no demand. We are trying to create that demand, generate interest in new and unusual species and promote diversity in the planted landscape. We distribute a list of D.A.N. member garden centers to plant sale customers, encouraging them to shop with you for their plant and garden needs. Take a look at a catalog and see which plants you already offer and which species you might like to add to your product mix. We sell out of many of these plants through preorders and we'd be happy to share information about our hot sellers with you so that you can meet the needs of your customers.

This year (1996) is the tenth anniversary of Master Gardening in Delaware. We are celebrating Master Gardeners throughout the year with a banquet in June and several special events hosted by each county. If you know a Master Gardener, consider expressing your thanks for the great job he or she does in educating the gardening public and promoting horticulture throughout the state.

I will be going on professional leave from July through December, 1996. I hope to bring back great information for Delaware nurserypeople. My responsibilities will be covered by Jo Mercer, Jay Windsor and Gordon Johnson, so you know you will be in good hands.

## **D.A.N. ENDORSES THE AAN LIGHTHOUSE FUND**

The Delaware Association of Nurserymen formally endorsed the AAN Lighthouse Fund, a new partnership initiative to support industry participation in national issues and to help ensure a profitable future. The program will enable D.A.N. members who do not belong to AAN to ensure they continue to receive the critical news, information and perspectives on national issues that AAN is uniquely qualified to provide.

D.A.N. members who participate in the Fund will also add new voices to AAN's national grassroots legislative network, helping to create a larger and stronger industry presence in Washington, DC. Voluntary participation in the Fund is \$36.50 per year--a dime a day--and offers the following benefits:

- Semi-annual Legislative Action Reports
- Periodic Legislative Alerts
- National Issues Updates via D.A.N. News
- Enhanced representation in Washington, DC

Annual contributions will be used to educate and inform the industry on critical national issues and generate national grassroots support on key federal legislation. No funds will be used for AAN general expenses or expenses associated with AAN-member focused programs.

For more information on the AAN Lighthouse Fund, call or write to Joel Albizo at the American Association of Nurserymen, 1250 I St., NW, Ste. 500, Washington, DC 20005.

## **WATER PROBLEMS IN NEW CASTLE COUNTY**

Excerpted from *Sunday News Journal*, January 7, 1996.

### **Susan Barton, Extension Specialist**

The summer drought of 1995 may be over but the problems still exist. Some utility customers came within hours of service disruptions last summer as reported by the *Wilmington News Journal*. But, more surprisingly, July and August shortfalls could reach more than 1.3 billion gallons in the year 2040. Restrictions on water use negatively impact the nursery industry. Now that the crisis of last September has been narrowly averted, it is time to work on solving New Castle County's water supply problems.

The Water Resources Agency for New Castle County has a short list of water supply alternatives for the region. One is a proposed 1.7 billion gallon Thompson Station reservoir along a branch of White Clay Creek north of Newark. A detailed environmental impact study is in progress for that and another proposed reservoir at Churchman's Marsh north of Interstate 95 west of Wilmington. Other solutions include:

- construction of a huge pipeline from Philadelphia or Cecil County, MD to convey up to 20 million gallons per day to northern New Castle County.
- construction of a desalinization plant for water from the Delaware River or C and D Canal.
- re-use of the millions of gallons of treated waste water now discharged each day into local creeks and rivers.
- development of underground reservoirs by pumping surface water into ground water aquifers for storage during time of high creek and river flow.

## **SUCCESS COMES ONLY TO THOSE WHO ARE DIFFERENT**

### **Susan Barton, Extension Specialist**

John Herbert, vice pres. for human resources at Knauber, a nine-store chain in Bonn, Germany with \$36 million in lawn and garden sales, spoke about retail at the 1996 AAN Management Clinic.

According to John Herbert, effective retailing revolves around respect for the customer and the supplier. He opens the door at 5 minutes to 9:00 to make customers feel welcome, provides cookies for the children and opens the door for customers as they leave. Herbert's opinions on effective retailing were built through years of experience. At one company he learned the magic of price and also learned how not to treat people. At Sainsburys in England, he witnessed the change from an elite image to a good value with the slogan "Good food costs less at Sainsburys."

Herbert's list of image fundamentals include the following:

1. the customer comes first
2. retail is detail
3. be trendsetters with a range of products
4. develop a healthy price to performance ratio
5. maintain the highest standards of cleanliness and tidiness
6. provide unusual customer service as the norm
7. there is always room for improvement
8. cherish innovation and creativity
9. make money before you spend money
10. focus on the human aspect.

To reduce a high price image, choose several high profile items and price those at the level of the competition. Use your own label to prevent price comparisons. Provide service with all your products. At Knauber, they cut lumber, provide a

repair shop for the bicycles they sell, maintain a kiln for customers to fire craft projects and wrap all plants sold in the garden center.

Staff costs run 20% of sales at Knauber. The average is 12 -15 % but the sales per square foot at Knauber is higher than the average.

John Herbert uses advertising to create an image. Knauber never does price ads. Large photographs are uninterrupted by price copy and appeal to specific markets, depending on the magazine or newspaper used.. Employee recruitment adds serve two purposes for Knauber. Large ads promise success for future-thinking employees that have a fascination with the industry. Ads include photos of new trainees. Both ads not only recruit employees but tell the general public who will help them when they visit Knauber.

John Herbert cares for and respects his employees. He visits each store once every six weeks and while he's there, he talks to each employee. He asks how are sales, how are stock turns and how are our margins. When he asks, he expects an answer. Herbert send cards to employees for birthdays, anniversaries and other significant events. He believes there are no bad soldiers, only bad officers.

Knauber stores are arranged around a central congregating market in the middle. A yellow walkway on the floor with a yellow ceiling structure parallel to the path leads customers through the store. The stores are open, with large walkways and plenty of space for people to get around.

Knauber includes a pet shop whose displays rival any aquarium. The bean counters didn't think they would get a sufficient return per ft<sup>2</sup> but Herbert insists that the image enhancement and draw for the entire store is worth it.

While John Herbert understands the magic of price, he insists that price is not the only way to attract and retain customers.

## **PLANT HEALTH CARE OR IPM**

### **Susan Barton, Extension Specialist**

*The following is a summary of two talks presented by Dr. John Ball at the 1996 Integrated Pest Management Conference at Villanova, PA on March 6, 1996.*

John Ball traced the history of the development of landscape maintenance. He started with cover sprays of the 1950's that followed calendar recommendations, included no follow-up and no record keeping. With the publication of *Silent Spring* by Rachel Carson in 1962, the public became concerned with pesticides through the late 60's and into the early 70's. That led to the see & spray strategy (SAS) of the 1970s.

Treatment decisions were straight forward and pest-oriented. Pesticides were the only control tactic. No follow-up or record keeping occurred but SAS was better than cover sprays.

Integrated pest management (IPM) was introduced to the landscape in the 1980's. With IPM, the treatment decision became a process. IPM was pest-oriented but included cultural control tactics. Scouts performed follow-up and records were maintained so the client wasn't the only indicator of success.

Plant health care (PHC) is the program for the 1990's. It involves proactive, managed care. It is client-, rather than pest-oriented. Scouts interact with the client and rewards are shared with the client.

Arborists and landscape managers strive for professionalism. They are often called tree doctors or tree surgeons. "In fact, arborists aren't like doctors," says John Ball, "they are like vets. Their customer is not the patient and they are

asked to do things by the customer that are not in the best interests of the patient." This situation often requires finesse. Scouts must be good plant people and good pathologist and entomologists, but they must also be good people people.

John Ball defines IPM as the selection, integration and implementation of pest control based upon predicted economic ecological and sociobiological factors. He defines PHC as a program of monitoring and proactive strategies to improve the appearance and vitality of landscape plants within the expectations of the client.

In a recent marketing survey, customers said they wanted to know what was happening in their landscapes. When asked what makes a landscape look well-cared-for. They listed a neatly mowed lawn and neatly pruned trees and shrubs as one and two on that list.

To understand plant health, John Ball believes you must understand vigor and vitality. Vigor is the genetic capacity to resist strain. We ensure vigor by selecting the right plant for each location in a landscape and improving plant characteristics with breeding and selection. Vitality is the ability of a plant to adapt. Once a landscape is established, vitality is all we can affect. But, PHC strategies are designed to improve plant vitality.

When you look at the carbon hierarchy of a tree, you see that resources are first allocated to maintenance, then new root growth and new foliage. Next, trees store resources. Then they use resources for increasing diameter. Finally, any remaining resources are used for defense. With plant health care, we try to increase the tree's ability to defend itself. Unfortunately, health is often equated with growth and fertilizer promotes growth. But when trees use resources for growth, they are less available for the other important functions. Trees do require nitrogen, but nitrogen applied at the wrong time may use

valuable resources needed for maintenance, storage or defense.

PHC includes a variety of strategies. At the design stage, select the right plant for every spot. Plant trees properly. Most trees are planted too deeply. Prune following naturally target pruning guidelines minimally to remove dead wood, suckers, crossing branches and branches that detract from the natural habit. Do not prune to reduce topgrowth at transplanting. Tree hazard management is part of PHC. Cabling and bracing can be used to reduce hazard if handled properly.

Soil management is a big part of PHC. Compaction is a huge problem in the urban and suburban environment. Radial trenching, 5-7 trenches, 18 inches wide and 12 inches deep around a mature tree in which soil is removed, loosened, mixed with compost and replaced shows promise for compaction reduction. By starting 2-3 feet from the base of the tree and placing radial trenches between root flares, little root damage occurs.

Traditional IPM is an important PHC strategy for dealing with pests when they arrive.

### **Marketing a PHC Program**

Marketing studies show that the majority of clients who contract for IPM (or PHC) as customers expect that some pesticides will be used for control even though these people identify themselves as “environmentalists.” Lawns and trees are the two areas of the landscape where people experience the most pest problems.

Most consumers get their information on plant problems from the garden center or from their neighbors. This provides an opportunity for landscape professionals to emphasize professionalism and knowledge that most

homeowners have little access to. Landscapers should advertise their knowledge rather than their possession of specialized equipment for the landscape.

To be professional with a PHC contract, landscapers must:

1. Do a landscape inventory. - Evaluate potential hazards. Assess current plant conditions and calculate a monetary value for the landscape. Also evaluate site conditions.
2. Offer several levels of intensity for PHC programs. - The levels of intensity can be based on visits per year. Offer a program with 2, 3, 4, 6 or 12 visits per year.
3. Calculate monitoring time. - The average time per residential site is 20 to 30 minutes per visit. Monitoring time varies depending on the number of plants, number of treatments, recording system and size of property.
4. Announce visits. - Use door hangers to announce when monitoring visits are made.
5. Provide written report. - Send a written report within one week of the monitoring visit. List the problems encountered and treatments provided. List “no treatment needed” when that is appropriate for a problem.
6. Establish action thresholds. - Very few economic or aesthetic thresholds exist for ornamental plants. More than 5 grubs in one square foot of turf or more than 2 aphids per leaf are reasonable thresholds. A homeowner usually notices about 5% defoliation and believes the plant is “ruined” at 10 % defoliation. Discuss action thresholds with customers. They are paying you to meet their needs.

## PRACTICAL SCOUTING TECHNIQUES

**Michael Cherim**  
**The Green Spot, Ltd.**  
**Barrington, NH**

Scouting is the act of searching for pests or diseases, or anything that may affect the outcome of the crop. It is important for detecting and isolating small problems before they get out-of-hand. Effective pest scouting is critical to a successful pest control program, regardless of your preferred corrective methods. It involves a game-plan with a definite strategy. The tips that follow are just an overview of some common greenhouse techniques. Their appropriateness may vary from situation to situation and some may be applicable to outdoor crops, outdoor landscapes and interiorscapes.

**Schedule scouting** - In addition to being ever-vigilant on a day-to-day basis, scouting should be performed at least once weekly, and should not be combined with another activity. Pick a day, and time of day, in which you are free to scout without interruption, e.g., Wednesdays from 10-11 AM. Do not deviate from this scheduled time from week to week, as a lack of consistency will affect accuracy, possibly resulting in unreliable data. When picking a block of time, choose a time of day when the greenhouse will be warm, well-lit and quiet, if possible.

**Make a map/scouting guide.** On a piece of paper, draw a scaled (e.g. 1/4" = 1') outline of your greenhouse, leaving plenty of room for location information (greenhouse number, etc.), time, date, notes and corrective action. In the greenhouse outline, draw dashed divider lines to mark 250 sq. ft. sections and number them. Make copies of the drawing and use a copy each time you scout to record observations for that week.

**Follow a route.** Make a consistent route through your greenhouse that takes you from section to section and keeps you on track. Starting at the first section, check your monitoring devices. Then go to the next section. When you've completed the route, go back to the beginning and start over, this time performing another scouting technique such as the paper method or total plant inspection (more later).

**Monitoring devices.** In each 250 sq. ft. section, place one sticky trap, preferably a 3" by 5" yellow type, and vertically align it so that it is perpendicular to the circulatory airflow and within 2-3" of the plant canopy. Change the traps weekly if pests are caught, to facilitate easy counting. Replace them at least once per month to ensure the sticky compound remains viscous.

Monitoring for fungus gnats with a sticky trap is a little different than the techniques employed for most other pests. Lay an additional trap per section on or near the growing medium, sticky side up. You can also use 1/4" thick cross-sections of raw potato (potato disks) to record larval presence. Place the potato disks on the medium. Turn them over to count the number of larvae that have come up to feed. Change the disks weekly.

One problem with sticky traps is they are nonselective. They catch biological control agents as well as pests. If you use biological control and find that you are catching more beneficials than pests, discontinue their use or sue them every other or every fourth week instead of weekly.

Other monitoring tools include magnifiers, pocket counters and blue traps (for thrips). Outdoors, sweep nets, field vacuums and pheromone traps may be useful.

**The paper method.** On certain pre-selected and numbered flowering plants in each section (be

sure to note these on your map), detect pests by tapping a flower or two onto a clean sheet of white paper. This dislodges the pests. When they fall on the paper count and record their numbers.

**Total plant inspection.** Thoroughly investigate four or more pre-selected and numbered plants in each section. Again, note these on your map. The number of indicator plants should vary based on the diversity of the section. Confine your inspection to those pre-selected plants. It is impossible to do a thorough inspection on all the plants in the section.

With a 10x-30x hand-lens, start at the top of each plant. Check the new growth. Move down the plant and direct your attention to the leaves, inspecting both the top and the bottom. At the bottom of the plant, check the oldest leaves. Look carefully at the surface of the medium and any exposed root structure. If possible, slide the plant out of the container and look at the roots. Then start back up the plant, looking at the stem and nodes.

Using the plant's number, record any abnormalities, such as deformed leaves, decay, insects (including ants, which may indicate the presence of certain pests), mites (look for webbing), pest predation and or parasitism, or anything out of the ordinary. Take leaf and insect samples, if necessary, to identify unknown pests or symptoms when you are finished scouting.

**Identify first.** Before taking any action, make a positive identification of the disease, insect or cultural problem. Decide whether the pests are of economic importance. If you plan to use biological control, you may need to know the specific species of a pest such as greenhouse whitefly, sweet potato whitefly, silverleaf whitefly, etc.

Invest in a few good books. Many problems can be diagnosed in-house with a good picture reference. However, if you are in doubt, send a sample to your county extension office or private service for identification or analysis.

**Record keeping.** By reviewing your weekly records, you can determine when, and possibly why, a problem occurred. You may be able to track pest population swings and growth rate, in-house movement, origin of problematic pests and diseases, and effectiveness of past corrective actions.

Looking back over years of records, you might be able to spot patterns, making preventative controls easier and more cost-effective to implement. However, do note that certain fluctuations form year to year, due to climatic conditions, natural pest population swings, etc. are normal, and should be expected.

Scouting helps put you in control of your greenhouse operation. You can increase crop value and decrease expenses by effectively controlling and preventing problems. Scouting may even help you find the root causes of those problems and control them once and for all!

Scouting is like physical fitness. The value is known, the program is fairly easy to implement, and the cost is minimal. All you have to do is start the program and stick with it.

Reprinted from *Southeastern Pennsylvania Greenhouse Growers' News*, June 1995.

## PHEROMONE TRAPS - WHICH ONE IS BEST FOR YOU?

**Karl Valley**  
**PA Department of Agriculture**

Pheromone traps offer growers a simple and inexpensive way to monitor various pests of ornamental plants. The recent interest in IPM on ornamentals has led to widespread use of these traps for several pests, including clearwing borers and Nantucket pine tip moth. These traps are also popular among people who monitor various fruit and field crop insects.

For several years I have used sticky traps for monitoring clearwing borer emergence. Recently I had an opportunity to use a plastic trap that works without the sticky material. Here are my impressions on the advantages of each of these traps.

### **Sticky Traps**

Widely used and extremely popular, these traps typically consist of a wire hanger, a cover or top, and a removable lower bottom coated with sticky material to capture the target insect (Fig.1). A one-piece disposable trap is also available (Fig.2).

It's the word "sticky" that makes me cringe slightly. Working with this trap can be messy whether you are setting one up, removing and replacing the sticky bottom, or examining the bottom part for the target species. It is almost impossible to avoid getting some sticky material on your hands. I usually keep a paper towel moistened with alcohol to help remove the material from my fingers. (I prefer this to harsher chemicals such as xylene). Disposable gloves such as the thin, tight-fitting surgical ones are ideal for working with this type of trap.

"Stickies" are ideal for shipping also. They can be partially folded, stapled shut, boxed, and shipped with a minimum of effort. Of the literally thousands of these traps that I've received through the mails during the past eight year, they have arrived in good condition and have been relatively easy to manipulate and reopen.

New traps are easy to store and take up a minimum amount of space. They are relatively inexpensive; a quick check of a 1995 catalog indicates traps purchased in a case lot of 25 cost approximately \$2.70 each. Purchasing the same trap but with a durable plastic top increases the unit cost to about \$3.20. Investing in the long-wearing plastic tops should mean lower costs because in future years you would purchase mainly lures and new bottoms. These traps are also available in disposable, one-piece models,

and their cost is even less (about \$1.50 each). Lures can cost from \$2-4.35 each, depending on type.

These traps are ideal for monitoring large, easy-to-recognize insects, ones that can be quickly "eyeballed" (identified) to species level. Overall, the sticky trap is a more versatile trap that can be used for capturing a great variety of target insects. Check with your dealer to determine which trap is most effective for the insect you plan to monitor.

### **Plastic Container Traps**

These traps are of a different construction than the sticky traps, and they can be used more than one year.

They are composed of several components (Fig.3). they also have a wire hanger (not included in the price) for suspending them from limbs and other structures. The top lid screws onto the bottom part, which is used for capturing the target insect. The bottom part has several small holes to drain away moisture, although I never experienced water problems during the summer I used these traps. The wide lid provides sufficient cover for the bottom so that most normal rainfalls should not be a problem. Fastened to the underside of the lid is a

cone-shaped structure that is reminiscent of a badminton "birdie" or shuttlecock; this part holds the lure and is directly above the center of the bottom part. The mouth of the bottom part contains a removable, shallow funnel. When moths fly towards the lure, they eventually end up in the bottom container, and the funnel effectively prevents their escape. Finally, a toxic-impregnated plastic strip is placed inside the bottom part to kill the moths.

The plastic traps are considerably more expensive than the sticky traps - a single unit costs approximately \$10.50. (This price includes the trap and the toxic strip). However, these traps are reusable, and after a good washing, the ones I used last year appeared almost brand new. I expect many years of service from these rugged traps. And once the initial investment is made, future costs would be confined to the lures (about \$2-4.35 each) and the toxic strips (about \$1.30 each).

The use of the toxic strip to kill the captured moths means not having to deal with any sticky material. But perhaps an even greater advantage is the overall good condition of the captured specimens, making them relatively easy to identify. I found this especially helpful for some of the smaller clearwing moths such as the dogwood and rhododendron borers. In many cases with sticky traps, these small moths become mired in the sticky material, obliterating the characteristic yellow bands on the abdomens, making identification more difficult.

These traps can also provide good material for a reference collection. Frequent monitoring will produce freshly killed specimens that can be easily pinned. Reference specimens are extremely valuable, especially if no color photographs are available. Although this method of collecting specimens takes some of the thrill out of the hunt, it is very time efficient.

Sending specimens captured in this type of trap is perhaps more difficult and time consuming than sending sticky traps. The captured specimens are removed from the trap and placed in a shipping container, where they have to be cushioned with some type of soft paper to avoid the damage that so often occurs when dry, fragile insects are shipped without proper protection.

So, what's my recommendation on these two types of traps? For trapping clearing borers, I'll continue to use the funnel traps because of my need to collect reference specimens, to obtain specimens that can be identified easily, and to avoid the sticky material wherever possible. I think these traps are a good tool for people who are learning to identify these insects for the first time. The good condition of the captured moths facilitates quick, accurate identification.

But when dealing with large numbers of traps where time is a factor and shipping is involved, then the sticky traps are my first choice. Despite the mess, I can examine them quickly and, if necessary, put the sticky bottoms under a microscope to examine specimens more closely or even remove them from the trap. You can even use a hand lens to examine specimens on the trap; just be careful of how close you get to the trap bottom!

If you are an experienced insect identifier, you should be able to use the sticky traps. Excellent color photographs are available for most of the insect pests for which we have pheromones. In the case of clearing borers, other information such as type of lure used, capture dates of the moths, and size of the adults is very helpful in identifying the moths, even when they are covered with sticky material.

Reprinted from *Regulatory Agriculture*, Spring 1995, Vol. 21.

## DIAGNOSING DEICING SALT INJURY TO WOODY PLANTS

**Ron Kujawski**  
**UMass Extension Educator**

The large quantity of salt used this winter could spell trouble for many roadside plantings. Similarly, salt applied to walkways and driveways could pose a problem to adjacent landscape plantings.

The deicing salt commonly used on streets and highways is rock salt, consisting of about 98% sodium chloride. Occasionally calcium chloride is applied, often in a mix with sand or rock salt, when temperatures near or below zero are expected. Calcium chloride is less toxic to plants than sodium chloride but its cost and handling problems (absorbs water and becomes caked) prohibit extensive use.

The problem for plants occurs when salt-laden snow is plowed onto soil areas above plant roots and when water with dissolved salt is sprayed onto foliage of evergreens by passing traffic or snow plows. It is likely that many Green Industry professionals will be called upon this spring to diagnose plant problems that are related to the use of deicing salts this winter. Here are a few diagnostic tips that can help you distinguish salt injury from other possible plant growth problems:

**Location:** Injury is typically confined to plants closest to road ways. Salt spray injury will be most evident on lower branches and those facing the highway.

**Timing:** Injury to evergreens, especially white pine, often becomes apparent during warm weather in late winter or early spring just prior to new growth. Deciduous trees may not show symptoms of injury until new foliage has appeared. With severe exposure to salt, vegetative and flower buds may fail to open.

Applications of deicing salt made in late winter and early spring are more likely to cause injury to roadside plants since this is the time when root activity begins anew and uptake of toxic chloride ions occurs.

### **Symptoms:**

Foliar: Needles of conifers affected by salt will turn yellow, reddish-brown, or brown. Dieback on needles starts from the tips, and a sharp demarcation between dead and green needle tissue is sometimes apparent. Salt spray injury to broadleaf evergreens appears as dead spots or large irregular dead areas on leaves, or the entire leaf may be dead. If injury is from salt spray only and is light, new growth will often appear normal. If injury is also from salts accumulating in soil, new growth will turn yellow or brown. Leaves of deciduous trees show marginal chlorosis or scorch.

General: Plants affected by salt spray and/or accumulation of sodium chloride in soil will show symptoms similar to those of drought, e.g. death of vegetative and flower buds, twig dieback, stunted growth (short internodes, small leaves), marginal leaf chlorosis, and premature fall leaf coloration and leaf drop.

### **What to do?**

Rain will usually wash salt spray from leaf surfaces, but in the absence of rainfall, hose down foliage with fresh water when practical. Injury from salt spray is often limited and new growth may be normal. However, accumulations of salt in soil can be far more devastating. The salt disrupts water and nutrient uptake by plant roots, leads to accumulation of toxic chloride ions in plants, and contributes to soil compaction by destroying soil structure. (This occurs when sodium ions replace calcium ions on the surface of soil colloids.)

Unfortunately, by the time the problem is diagnosed, the injury may be irreversible. Nevertheless, if areas of salt accumulation in landscape soils are evident, heavy irrigation of soil may prevent some of the damage if done early enough. (On soils with very high clay content, irrigation may not be effective in leaching the salt.)

Salt moves quickly through most soils, and it should be noted that at the time injury appears on deciduous plants from heavy salt-laden soils, the salt may have already leached away and not be detectable in a soil analysis. For this reason, testing soils for salt levels may not be useful in diagnosing salt induced plant injury.

Applications of gypsum (calcium sulfate) is widely reported to counteract the affects of sodium chloride on soil structure. If you use this product, follow application guidelines on the gypsum label. A rate of 100 pounds per 1000 square feet is not unreasonable.

## **FEATURED PLANTS FOR 1996**

### **Sunflowers and Radishes**

The National Garden Bureau has deemed 1996 the Year of Sunflowers and Radishes. These selections, sunflowers for their continuing popularity and radishes for their diversity, mark the 16th year the bureau has chosen a flower and vegetable to be featured in national promotions targeting home gardens.

### ***Penstemon digitalis* ‘Husker Red’**

The Perennial Plant Association recently announced the 1996 Perennial Plant of the Year - *Penstemon digitalis* ‘Husker Red’. Commonly called Beardtongue, ‘Husker Red’ is a white-flowered, red-foliaged form of *P. digitalis* that was introduced in 1993. It is a versatile garden

perennial, valuable as a specimen, or as a cut flower. When plants are well established, height averages about 30 inches, with as many as 50 white flowers on each of 20 or more open, airy, flower stalks during July and August.

**MANAGE: NEW TURF  
POSTEMERGENCE HERBICIDE**

**Dr. Jeffrey F. Derr, VPI**

MANAGE is a new postemergence herbicide for use on turf. The proposed common name for this herbicide is halosulfuron. This compound is also being developed under other trade names for certain cropping situations. Halosulfuron is a member of the sulfonylurea class of herbicides. The sulfonylurea class of herbicides includes such compounds as Classic, Pinnacle and Oust.

MANAGE provides post emergence weed control, along with a degree of residual control. The half-life of the chemical in soil is approximately one month. A non-ionic surfactant should be added to the spray tank when applying MANAGE. A wide range of cool and warm season grasses, including Kentucky bluegrass, tall fescue, perennial ryegrass, bermudagrass, and zoysiagrass, are tolerant of MANAGE. Work in Virginia by Mr. Mark Czamota and Dr. S. Wayne Bingham demonstrated the safety of MANAGE in a variety of turf species.

The primary focus of MANAGE is nutsedge control. An advantage of this herbicide is that it controls both yellow and purple nutsedge. Certain other herbicides, such as Basagran, control yellow nutsedge but do not provide acceptable control of purple nutsedge.

In my trials, MANAGE was not as effective as Pennant for preemergence yellow nutsedge control. MANAGE provided about one month of residual yellow nutsedge control. It provided very good control of yellow nutsedge when applied postemergence. I found that one

application of MANAGE provided better postemergence yellow nutsedge control than a single application of Image, Basagran, Classic, or Roundup. This may be due in part to the residual activity of MANAGE. Basagran and Roundup do not provide residual weed control. Multiple applications of MANAGE may be needed for season-long nutsedge control, especially in dense stands. MANAGE has not provided acceptable control of annual grasses in my trials, but has controlled certain broadleaf weeds. Since MANAGE is a systemic herbicide, control symptoms are slow to develop. The pace of symptom development is similar to that of Roundup. Along with evaluating nutsedge control, I have been investigating nursery crop tolerance to MANAGE. A selective postemergence herbicide for yellow and purple nutsedge control is needed for nursery crops and I have been devoting considerable research time toward this objective. Since MANAGE was developed for turf use, a natural extension would be its use in nursery and landscape plants. Unfortunately, I have observed damage in several woody ornamental following overtop applications of MANAGE. Injury symptoms observed were leaf chlorosis, stunting of shoot growth, and abnormal leaf development. Further research is needed to find ways of improving nursery crop tolerance to MANAGE. Care should be taken when applying Manage in a turf situation to minimize drift onto landscape ornamentals.

Reprinted from the *Virginia Tech Plant Protection Newsletter*, Vol. 14, No. 4, December 1995-January 1996.

## PROTECT YOURSELF WITH A GOOD CONTRACT

**Russ Powell**

### **Pennsylvania Cooperative Extension**

Contracts should protect all parties involved. Before you sign another contract, read everything and make sure you thoroughly understand all parts of the agreement so your interests will be protected.

Yes, I know this topic is almost as exciting as watching grass grow, but it is important if you plan to stay in business for more than one season.

All contracts have (or should have) certain basic components. Unfortunately some of the most important things that can really cause problems are easily overlooked. We'll take a look at the basics of any landscape contract and some of the points you should consider.

1. Who is the contract with: A property management company or a homeowners association? Make sure that you are dealing with the person(s) that have the authority to make decisions. Know who they are responsible to.

2. What is the term of the agreement? Specify the beginning and ending dates. Make sure that renewal and termination procedures are carefully explained. If there is a complaint, will you have the opportunity to correct the problem? How long will you have to correct it?

3. What is the scope of the work? This area deserves special attention because this is often where misunderstandings occur.

- Specify not only what you will be doing, but how often and with what equipment. For example: Will sidewalks be edged with a mechanical edger or with a weedeater?

- If pruning is included, how often and what plant material? Do you have the ability or equipment to prune 20 ft. trees?
  - When will fertilization take place? Are shrub beds included, or just turf? Also consider basing the application of fertilizer on a soil test. The few dollars spent on a soil test may save you hundreds in fertilizer, and achieve better results.
  - When will weed control applications be made? What weeds will be controlled? Will beds be hand weeded? Don't forget specifics about mulching, deadheading flowers, etc.
  - Will grass be maintained within a specific height range or are there simply a specified number of cuttings? What will or won't you do if some homeowners in a development water their lawns and request more frequent cuttings than those who don't water?
  - What work is not included? How will additional work be handled?
  - If a homeowner makes a fertilizer or pesticide application that results in damage, are you responsible for correcting the problem?
4. What is the timing of payment and what penalties are there for late payment?
5. How often will there be inspections (or walkthroughs), who will participate, and what is the scope?
6. Who will dispose of trash, and where will it be disposed of?
7. Consider a clause about working (or not working) in adverse weather conditions.

8. Include a provision about who would pay for litigation if the agreement must be interpreted or enforced. Generally the prevailing party is entitled to reimbursement of reasonable attorney's fees and/or court costs.

9. If subcontractors will be used, specify this in the contract. Be sure that all subcontractors have general liability and worker's compensation insurance. Not everyone that you think of as an independent subcontractor is viewed the same way by numerous government agencies.

10. Every situation is different. Carefully evaluate the circumstances and then include provisions in your contract to protect yourself from potential problems.

There are times you may be better off by not specifying every little detail, but be careful about using generalities because they may turn out to be very costly. One example of this is signing a contract that specifies that you will maintain "a healthy green lawn" and then there is no rain for two months and no way to irrigate. What are you going to do when the homeowner asks "Where is the green lawn that you promised?"

In general, think of everything that could possibly go wrong, and then do your best to protect yourself.

Reprinted from *Green Business Reporter*, Vol. 7, No. 6, January 1996.

## PESTICIDE NEWS

### Insecticides:

SANMITE (pyridaben) - BASF Specialty Products, Durham, NC. A new miticide-insecticide which is said to be effective on mites and whiteflies and has recently received its EPA registration for use on 28 plant species, including pot and foliage plants. The product's active ingredient is pyridaben, a compound new to the US. In research trials, this chemical/compound reportedly was almost 100 percent effective for controlling adult whiteflies for up to 15 days after application. Sanmite carries a 12-hour restricted entry interval.

CITATION (cyromazine) - Ciba - As a result of IR-4 Project 16 new species of ornamentals have been added to the label.

PROVADO (imidacloprid) - Bayer - received an EPA label to use on Christmas trees to control aphids, adelgids and sawflies.

SCIMITAR CS (lambda-cyhalothrin) - Zeneca - received EPA approval to use on golf courses to control turf insects such as Japanese beetle, mole crickets, armyworm and chinch bugs.

DIMILAN 25W (diflubenzuron) - Uniroyal - Received EPA registration to use to control fungus gnats in greenhouses and shadehouses.

DIMILAN (diflubenzuron) - Uniroyal - As a result of IR-4 Project primrose and lobelia have been added to their label.

HEXYGON (hexthiazox) - Gowan - A new insecticide developed for commercial ornamental use and for usage on nonbearing trees and vines.

NEEM GUARD (neem oil) - W.R. Grace - EPA approved a request to register this new active ingredient on non food, on feed crops in and

around commercial nurseries and residential structures.

KNOX-OUT (diazinon) - W.A. Cleary - received expanded label from EPA. Can now be used on nursery and commercial applied landscapes as well as greenhouses and interiorscapes. The usage on poinsettias has also been added as well as whitefly suppression. Available in one gallon and one quart containers.

### **Fungicides:**

CLEARY 3336 (thiophanate-methyl) - W.A. Cleary - New labeling includes a 12-hr re-entry interval, expanded use sites approval for backyard non-commercial fruit trees and the control of basal stem anthracnose on turf.

FUNGINEX (triforine) - Ciba - As a result of IR-4 Project 23 new species of ornamentals have been added to their label.

RIDOMIL (metalaxyl) - Ciba - As a result of IR-4 Project 30 new ornamental species have been added to their label.

FUNGO-FLO (thiophanate-methyl) - Scotts - Greenhouse usage has been added to this label.

TURFCIDE 400/Terraclor 400 (PCNB) - Uniroyal - Received an expanded label from EPA to increase the number of landscape planting and cut flower species it can be used on.

### **Herbicides:**

DERBY (metolachlor/simazine) - Ciba - As a result of IR-4 Project 20 new species have been added to their label.

OUST (sulfometuron) - DuPont - as a result of IR-4 Project label usage on balsam fir, Douglas fir and white pine have been added.

SURFLAN (oxyzalin) - Dow Elanco - As a result of the IR-4 Project 65 new ornamental species have been added to their label.

ASULAX (asulam) - Rhone Poulenc - Added to their label the usage on English ivy, periwinkle, mugo pine, white pine, and Japanese spurge.

CASARON 10G (dichlobenil) - Uniroyal - deleted from their label aquatic usages.

COMPADRE (glyphosate) - Monsanto - A new formulation developed as a cut-stump treatment on trees to prevent regrowth.

SIMAZINE - Ciba - Added to their label the usage on bald cypress, cotoneaster, euonymus, false cypress, heavenly bamboo, weeping birch and yew.

VETERAN 720 (dicamba/2,4-D) - Riverdale - A new formulation developed for brush and perennial weed control.

### **Miscellaneous:**

B-NINE SP ( deminozide) - Uniroyal - The signal word on the label has been changed from caution to danger and the phrase "For use only in commercial or research greenhouse or shadehouse" has been added.

SUMAGIC (uniconazole-p) - Valent - Added to their label the usage on woody landscape plants.

Starch: A Renewable Treatment for Pesticide Clothing - Ordinary laundry starch has been found to protect pesticide applicators from harmful chemicals. Starch binds with chemical pesticides and keeps them away from the skin until the clothing can be washed. Additionally, the starch-bound chemicals are easily washed from the clothing. Cotton or cotton-polyester garments which have been starched provide a durable finish that traps pesticides, prevents their

transfer to the skin, and allows moisture vapor to be transported away from the skin. Proper protective clothing should always be worn when applying pesticides, and clothing used during pesticide application should be washed separately from all other clothing.

(Source: *Kansas Pesticide Newsletter*, 17(6) by way of University of California *Environmental Toxicology Newsletter*, Feb., 1995).

**Pesticide Disposal Sites:** Delaware residents may use these sites for disposal of unwanted pesticides 8:30 am to 3:00 pm during the weeks indicated:

**New Castle County**- 1st Saturday of each month, Delaware Reclamation Plant, 1101 Lambson Lane, New Castle - 2nd Saturday of each month, Pine Tree Corners Transfer Station, Rd. 25, Townsend.

**Kent County** - 3rd Saturday of each month, Cheswold Collection Station, Rd. 153 Cheswold.

**Sussex County** - 4th Saturday of each month, Southern Solid Waste Management Center, Route 20, Jones Crossroads.

### **Restricted Entry Intervals**

The EPA has released a list of 95 products that have been allowed a 4-hour restricted entry interval (REI) under the WPS on the basis of the low risk they represent to agricultural workers. If you want a copy of the list or want to check if a particular pesticide is on the list, give me a call (302-831-2531).

## **RESEARCH BRIEFS**

### **Propagation:**

**Rooting of Deodar cedar cuttings.** Interrupted light was used to increase rooting percentage of Deodar cedar from less than 50% to 84% at Watkins Nursery. After good root initiation (approx. 10 weeks), a timer-controlled halide lamp was suspended 8 ft. above the trays and programmed to turn on from 10:00 PM to 2:00 AM every night. After approximately 7 weeks, the halide lamp is turned off. T.D. Watkins.

Previous article excerpted from *VNA newsletter*, November/December, 1995.)

***Uniola paniculata*.** The best regime for growing *Uniola paniculata* from seed included planting seed soon after harvest in the fall and treating seed with 100 ppm GA<sub>4</sub> for 24 hours (better than 500 ppm). Liners should be planted with crowns even with the media surface. No supplemental nitrogen or micronutrients were necessary. G.R. Bachman and T. Whitwell.

Previous article excerpted from *HortTechnology*, 5(4) Oct./Dec., 1995.

**Bare root shade tree whip production.** A method for producing bare root whips in copper-treated containers is described. Fruits picked in September and stored at 45 F until sown in February. Whips produced by transplanting seedlings to Spinout-treated square plastic containers by mid-March, grown in heated greenhouse until mid-May, transferred outdoors to 70% shade for one week and repotted into Spinout-treated No. 3 round black plastic containers by June 6. Metro Mix 360 was used as the germination and greenhouse production media. Several media were found to be suitable for bare root whip production: 3:1:1, 2:2:1 or 2:1:2 sand: composted municipal sludge: Isolite. These media could be easily separated from the

root systems of eight taxa. Whips grown in copper-treated containers had fibrous root systems with many intact root tips. Bare root whips had high transplant survival and re-growth potential. This production method has the potential for commercial production of difficult-to-transplant (coarse-rooted) species; it combines the advantages of high transplant survival of container stock with the ease of handling of bare root stock. D.K. Struve.

Previous article excerpted from *J. of Environ. Hort.*, 14(1), March, 1996.

### **Field Production:**

**Post-transplant survival of bare-root whips.** Bare-root hawthorn water stress increased during cold storage more rapidly than maple. The desiccation sensitive nature of hawthorn is most likely related to water loss from stems since coating hawthorn stems with wax at transplanting minimized water stress and maximized bud break. Survival rates for transplanted bare-root hawthorn trees are relatively low in the nursery industry. From this and other work, the authors recommend that the shoot and roots of desiccation sensitive species be enclosed in a bag during cold storage and that stems be treated with an antidesiccant at transplanting. R.N. Bates and A.X. Niemiera.

Previous article excerpted from *J. of Environ. Hort.*, 14(1), March, 1996.)

### **Container Production:**

**Root control in pot-in-pot production.** Biobarrier, a landscape fabric with trifluralin herbicide-impregnated nodules, did not prevent circling roots, but sheets containing at least 8 or 20 nodules of trifluralin acceptably prevented root escape from drainage holes in the pot-in-pot production of 56-liter container river birch trees and Yoshino cherry trees, respectively. J.R.

Harris, A.X. Niemiera, R.D. Wright and C.H. Parkerson.

**Less irrigation with diatomaceous earth granule and kelp extract.** *Hibiscus rosa sinensis* were grown in media amended with Axis, a kiln-fired diatomaceous earth granule and treated with Agroroots, a kelp extract. Both products may allow container plant production with less irrigation. Further tests should be conducted with a broader range of species. A.W. Meerow and T.K. Broschat.

Previous two articles excerpted from *Hort Technology*, Jan./Mar. 1996.

**Nutrient recovery from container grown tree seedlings.** Plant nutrient recovery for black gum and red oak seedlings and all fertilizer treatments (Woodace slow release fert.(21-4-10) at different rates or the same slow release product combined with daily N fertigation from 15-16-17 Peter's or N fertigation only) was low. The results do not suggest an efficient fertilization method. Thus, nursery managers concerned about environmental quality face a dilemma: at present, there is no way to increase fertilizer use efficiency of container-grown red oak and black gum plants without reducing plant growth (and potential gross nursery revenue). Reducing the amount of fertilizer applied (while holding irrigation volume constant) will reduce the amount of N, P, and K in the leachate, but plant growth will also be reduced. Until a better understanding of nutrient uptake patterns by different plant species is obtained, the best method for managing nutrient loss from container production sites is through irrigation application rate and delivery methods, and by nutrient capture and recycling systems. D.K. Struve.

**Low temperature survival of container herbaceous perennials.** The following are lists of plants categorized by the lowest temperature at which they remained salable.

- 12 F - *Phlox* 'Chattahoochie,' *Phlox* 'Morris Berd' and *Tiarella* 'Laird of Skye'
- 18 F - *Campanula takesimana*, *Heuchera americana* 'Dales Strain,' *Penstemon fruticosus* 'Purple Haze,' *Rosmarinus officinalis* 'Arp,' *Tiarella* 'Running Tapestry' and *Tiarella cordifolia* 'Slick Rock'
- 23 F - *Erodium reichardii* 'Roseum,' *Hebe macrocarpa* 'Margaret' and *Verbena* 'Homestead Purple'
- unfrozen controls - *Houtteyenia cordata* 'Chameleon' and *Thelypteris kunthii*
- failed to survive - *Hibiscus* cv. ('Blue River II,' 'Disco Belle Pink,' 'Disco Belle Rose Red,' 'Disco Belle White,' 'Lord Baltimore' and 'Southern Belle')

In general, plants showed a gradual decline in salability with decreasing temperatures. T.A. Herrick and L.P. Perry.

Previous two articles excerpted from *J. Environ. Hort.* 13(4), December, 1995.

**Cyclic irrigation.** Leachate volumes were reduced about 54% with cyclic irrigation (either a 30 minute or 2 hour resting phase) compared to continuous irrigation of .15 in. with container-grown *Ageratum houstonianum* 'Blue Puffs.' Total N leaches was about 47% less with the cyclic treatments compared to continuous irrigation. Cyclic irrigation could be incorporated into irrigation management without substantial investment using equipment currently available at many container nurseries. D.C. Fare, C.H. Gilliam, G.J. Keever and R.B. Reed.

Previous article excerpted from *J. Environ. Hort.* 14(1), March, 1996.

**Copper-treated containers.** Growth of *Coreopsis verticillata* 'Moonbeam' was unaffected by container type but growth of *Plumbago auriculata* was greater for plants

grown in copper-treated fiber containers as compared to black plastic containers. Root circling was controlled in both species in copper-treated fiber pots. It is important to remove treated fiber containers at transplanting to allow for normal root development. J.M. Rutter.

Previous article excerpted from *HortTechnology*, 5(4) Oct./Dec., 1995.

### **Greenhouse Production:**

**Lateral branching of chrysanthemum.** This work indicates that for best lateral branch production, the commercial chrysanthemum producer should avoid extremes in medium temperature and maximize available photosynthetic photon flux (PPF) during all phases of growth before pinch. R.K. Schaellhorn, J.E. Barrett. T.A. Nell.

**Reduce P leaching.** Soilless media have poor P-retaining ability and allow as much as 75% of the P applied to be leached and lost. Phosphorus-charged alumina at 1% or 2% of total medium volume was sufficient to grow marigolds for at least 8 weeks and substantially reduced P leaching compared to conventionally fertilized controls. Y.P. Lin, E.J. Holcomb, J.P. Lynch.

**Seasonal growing environments for potted miniature roses.** Plants grown in a high temperature, long-day regime (HTLD) had more flowering shoots, flowered faster, were shorter and had smaller and lighter colored flowers than plants grown in low-temperature, short-day (LTSD) conditions. These results suggest benefits from summer production of potted miniature rose plants and the possibility of using a higher-temperature forcing regimen than is normally recommended for winter production. T.M. Kyalo, H.B. Pemberton and J.M. Zajicek.

Previous three articles excerpted from *HortScience*, Vol. 31(1), February 1996.

**Gerbera seed germination.** *Gerbera* seedlings were not sensitive to short-term water logging in a soilless medium. High seedling mortality and/or self-branching was not induced by low rates of ethephon application. *Gerbera* seed should not be covered during germination, because exposure of the seedling apex to light is critical for normal seedling germination and growth. It is evident that *Gerbera* requires high irradiance for normal seedling development immediately after germination; supplementary lighting during low irradiance conditions is recommended. R. Moe, J.E. Erwin and W. Carlson.

Previous article excerpted from *Hort Technology*, Jan./Mar. 1996.

**Coal bottom ash as container medium.** A mixture of coal bottom ash and hardwood bark seems promising as a soilless medium for the production of greenhouse roses. Requirements for fertilization and irrigation were higher in the ash:bark medium than in a soil:peat medium. The use of recycling systems could reduce additional costs from more frequent fertilization and irrigation. S.H. Butler and B.C. Bearce.

Previous article excerpted from *J. Environ. Hort.* 13(4), December, 1995.

**Paclobutrazol as spike or drench.**

Paclobutrazol is more effective at reducing shoot length as a spike than as a drench. Spikes were least effective when used in a peat-based medium containing Bacctite (a compressed peat product designed to increase aeration and cation exchange capacity) or in a finely ground composted pine bark medium. Due to the effectiveness of spikes in most media (6 others tested) a lower amount of chemical can be applied to achieve results equal to drench applications. Application of spikes during pinching or spacing could eliminate a

handling step for poinsettia production. S.E. Newman, J.S. Tant.

Previous article excerpted from *HortScience*, 30(7), December, 1995.

**Cut Flowers:**

**Sugars reduce irradiation damage.** Exposure to ionizing radiation is expected to be a substitute for methyl bromide fumigation for cut flowers infested with insect pests. But irradiation accelerates chrysanthemum bloom wilting and foliage yellowing and suppresses bud opening. Aqueous solutions (2%) of sucrose, glucose, fructose or maltose delayed bloom wilting and foliage yellowing of cut chrysanthemums caused by gamma irradiation. Silver thiosulfate, gibberellin and other preservatives did not reduce irradiation damage. T. Hayashi and S. Todoriki.

Previous article excerpted from *HortScience*, Vol. 31(1), February 1996.

**Buddleia and Salix grown as cut flowers and stems.** The number of harvested stems per plant decreased by the number of stems/m<sup>2</sup> increased with increasing plant density in all taxa. No significant differences in stem length or stem diameter occurred except with *Salix alba* 'Britzensis' in which the longest stems occurred at the highest density. A.M. Armitage and M.A. Dirr

Previous article excerpted from *J. Environ. Hort.* 13(4), December, 1995.

**Weed Control:**

**Preemergent herbicides in field-grown landscape crops.** The herbicide combination of 20% isoxaben plus 60% oryzalin (Snapshot, DF formulation) and 0.5% isoxaben plus 25% trifluralin (Snapshot, G formulation) at 4 lb/A provided excellent long term suppression of

annual and perennial weeds and no visible injury to common ornamentals. Based on the findings related to stem diameter, further research on the effect of these combinations on long-term growth of woody species is needed. Dithiopyr (Stakeout, 1%G) at 2 lb/A also provided excellent long-term suppression of annual weeds and yellow nutsedge and showed strong residual activity, based on continued weed suppression, well into October of each year. No significant phytotoxicity to ornamentals was apparent after application or upon long-term growth. Metolachlor (Pennant) or metaolachlor plus simazine (Derby) treatments provided excellent grass suppression (>85%) and good (> 90%) control of yellow nutsedge. Metolachlor (Pennant) plus isoxaben (Gallery) may prove to be an effective combination for management of a broad weed spectrum. Further research is needed to investigate selectivity and phytotoxicity of these promising herbicides and combinations in a wide selection of landscape species. N. Setyowati, L.A. Weston and R.E. McNiel.

Previous article excerpted from *J. Environ. Hort.* 13(4), December, 1995.)

#### **Disease Control:**

**Dogwood anthracnose.** Light and drought stress were studied as predisposition factors for dogwood anthracnose. Shade increased disease severity; maximum disease progression values for trees in thoroughly watered treatments were about 5% at 100% light and 50% light, 35% at 10% light, and 26% at 2% light. Drought increased disease severity on all shaded trees, where disease progression increased 625% in 50% light, 43% in 10% light and 31% in 2% light compared to 100% light. Drought had no effect on disease severity of unshaded trees. Planting dogwoods in full sun light and keeping them thoroughly watered should help to control this disease. D.K. Erbaugh, M.T. Windham, A.J.W. Stodola and R.M. Auge.

Previous article excerpted from *J. Environ. Hort.* 13(4), December, 1995.

**Damping-off in bedding plants.** Control of pre-emergence damping-off was effective with Al-drenches for snapdragon and vinca at all concentrations but only effective for petunia at the highest concentration (50 meq Al/100cm<sup>3</sup>). The pathogen, *Phytophthora parasitica* was suppressed early in the host-pathogen interaction. Petunia was susceptible to damping-off for a longer period before seedling emergence. Al was not phototoxic to vinca, snapdragon or petunia grown in a limed medium. D.M. Benson.

Previous article excerpted from *HortScience*, 30(7), December, 1995.

#### **Insect Control:**

**Elm insect pest control.** Both soil and trunk injections of the newer systemic insecticides, particularly Merit, have the potential to control most of the significant insect pests associated with elm. Furthermore, an unusually high degree of persistence was observed with both soil and trunk applied Merit, providing excellent control of all three pest species a year following application. This desirable feature, however, must be balanced by the relatively slow rate of uptake and expression of control. This will require uses made in anticipation of problems rather than as a treatment of acute outbreaks requiring rapid control. D.C. Sclar and W.S. Cranshaw.

Previous article excerpted from *J. Environ. Hort.* 14(1), March, 1996.

#### **Landscape:**

**Tree transplant size.** Results from this study demonstrate that transplant size is an important variable to consider when planting maple trees in

urban environments. Compared to large trees, small trees grew more during the first two years after transplanting and had higher gas exchange and leaf water potentials, all indications of their ability to overcome transplant stress more quickly. In addition to more rapid establishment, smaller transplants have lower planting and replacement costs, and require less maintenance. D.M. Lauderdale, C.H. Gilliam, D.J. Eakes, G.J. Keever and A.H. Chappelka.

Previous article excerpted from *J. Environ. Hort.* 14(1), March, 1996.

**Erosion control.** Soil Sement, an acrylic copolymer emulsion (SS) and Ecotak -OP, derived from *Cyamopsis tetragonolobus* (EOP) along with plugs of *Deschampsia caespitosa* were tested for erosion control on a slope at the Davis Arboretum at the University of California, Davis. The presence or absence of grass plugs made no difference in sediment loss within the treatments. Sediment loss was high in the control plots, low in the SS plots, and began low in the EOP plots, but increased as the compound began to degrade or gradually wash out of the soil. R. Edberg.

Previous article excerpted from *AABGA*, February, 1996.

**Therapeutic benefits of being in a garden.** Research sponsored by the Center for Health Design on the use and therapeutic benefits of hospital gardens finds an overwhelmingly positive response from employees, patients, and their families and friends. Of those who were observed and interviewed while in a garden, 95 percent reported a therapeutic benefit. According to the study, this manifests itself in employees being more productive, patients feeling better and having more tolerance of medical procedures, and family and friends feeling relieved of stress.

Previous article excerpted from *People-Plant Council News*, 5(1), Winter 1995.

**Tree shelters.** Tree shelters significantly improved initial survival and growth of float tray seedlings on an alluvial bottom site, a hardwood seedling nursery bed site, and 3 surface mine sites. The tree shelter helps the newly planted seedling maintain its water content, avoiding desiccation, while it is establishing a root system and research shows that these shelters aid in plantation establishment over a wide range of planting sites. J.W. Stringer.

Previous article excerpted *American Paulownia Association*, 5(1), January, 1996.)

**Herbicide residues.** Grass clippings comprise at least 35% of yard waste. Clippings were collected from turf sprayed with a mixture of 2,4-D and dicamba and MCPP. Tomato, marigold and cucumber growth was reduced by mulching with treated clippings (even those collected 15 days after treatment). Thicker mulch produced more growth reduction. *Salvia* was unaffected by treated clippings, possibly because the plants were larger at the time of mulching. A.R. Bahe and S.H. Peacock.

Previous article excerpted from *HortScience*, 30(7), December, 1995.

### **Marketing:**

**Training garden center employees.** 100 master gardeners were surveyed about the store where they most frequently bought plants. Master gardeners who shop at garden centers perceived employees as four times more available than master gardeners who shop at mass merchandisers perceived. Garden center master gardeners had more confidence in the knowledge of employees (3.7 on a scale of 1 to 5) as compared to master gardeners who shop at mass

merchandisers (2.1 confidence rating). Neither group was close to a full confidence rating of 5.

This survey revealed an inefficiency and lack of training practices of many Alabama garden centers. Many provide employee training on an as-needed basis, resulting in the minimum use of employee skills. Most employees have little or no formal horticultural training and many have little experience in horticulture. Yet most receive limited, if any, formal training when hired. Most of their training comes from one-on-one instruction by the owner, manager, or supervisor, which is an inefficient means of teaching basic skills. Most employees feel that further training would be helpful. Training appears to be adequate over time, according to employees, but they come into the job with little knowledge, especially with no written job description. M.B. Musgrove, J.D. Williams, B.K. Behe and K.M. Tilt.

(Previous article excerpted from *HortTechnology*, Jan./Mar. 1996.)

#### **New Releases:**

***Syringa vulgaris* ‘Prairie Petite.’** ‘Prairie Petite’ is a selection with a compact, dense growth habit. The initial color of newly opened florets is light pink, which fades to light lavender as the florets mature. ‘Prairie Petite’ is vegetatively propagated by divisions, stem cuttings, or micropropagation techniques. Division is usually performed in early spring and cuttings are taken during the spring and summer season. Plant material of ‘Prairie Petite’ will be offered for sale through Briggs Nurseries, 4407 Henderson Blvd., Olympia, WA 98501. D.T. Lindgreen, G. Viehmeyer and R. Uhlinger.

***Dianthus caryophyllus* ‘Prairie Pink.’** ‘Prairie Pink’ was released for its winter hardiness, compact growth, attractive pink double flowers and repeat blooming. Its primary use is as a

perennial border plant, but it also can be used as a cut flower. Plants bloom for 2 to 4 weeks beginning in early June and reflower in late summer. They will flower sporadically from June to late summer. ‘Prairie Pink’ is vegetatively propagated from stem cuttings. Plant material is available for sale from Bluebird Nursery, PO Box 460, Clarkson, NE 68629. D.T. Lindgren and R. Uhlinger.

Previous two articles excerpted from *HortScience*, Vol. 31(1), February 1996.

covered are: complete maintenance estimating worksheet, points of cost generation, how to estimate (each area of grounds operation), fertilization application tables, and much more. The booklets are 8 1/2"x 11", and are pre-drilled for three ring notebooks. Cost is \$12 each for quantities of three or more (or \$15 otherwise), available directly from PGMS at 120 Cokeysville Rd., Suite 104, Hunt Valley, MD 21030, Tel:(410)584-9754, Fax:(410)584-9756.

**Woody-Pest Slide Set Available.** The Ohio Nursery and Landscape Asso., Westerville, OH, is offering a slide set to be used in conjunction with its 1993 publication *Common Insect Pests and Diseases of Ornamental Trees and Shrubs*. Set contains 160 slides depicting various life stages of pests and diseases that plague woody ornamentals. Slides are accompanied by a one-or two-paragraph description and fact sheets that provide a full page of information on each pest. Cost is \$89 for the slide set and \$109 for the larger purchase package. Booklet are \$2. To order, call ONLA at tel:(800)825-5062, Fax:(800)860-1713.

**New Books for Nursery Industry Know-How from American Nurseryman Publishing Company.** Hardy Perennials, by Graham Rice, hardcover \$27.95. Flowering, Fruiting and Foliage Vines, by Chuck and Barbara Crandall, hardcover \$27.95. Gardening for Wildlife, by Craig Tufts and Peter Loewer, hardcover \$29.95. Alpines, by Clive Innes, hardcover \$39.95. Clematis, by Jim Fisk, paperback, third edition \$19.95. Daffodils for American Gardens, by Brent and Becky Heath, hardcover \$24.95. The Wild Lawn Handbook, by Steve Daniels. Color, line drawings index, appendices \$22.95. Successful Small Gardens, by Roy Strong, hardcover \$29.95. To order or receive a free catalog, call (800)621-5725.

**1995-96 Compost/Organics Buyers Guide** a valuable resource for all compost and mulch producers as well as nursery operators, lawn and garden contractors, etc. For more information call (216)255-1454.

**Today's Garden.** This October 1995 publication encourages youngsters to enjoy the pastime of gardening. Send a self-addressed, stamped envelope to obtain your copy. Contact: Mary Nielson, National Garden Bureau, Suite 310, 1311 Butterfield Rd., Downers Grove, IL 60515; Tel:(708)963-0770.

**Grounds Maintenance Estimating Guidelines.** Published by the Professional Grounds Management Society. The 36-pg. booklet comprises all of the key areas of estimating indispensable to grounds managers, facilities directors and independent landscape contractors alike. Some areas

**Diseases of Turfgrasses,** by Houston B. Couch Ph.D. This is a basic turfgrass reference. This new edition is the most complete work currently available on turfgrass diseases. The book also abounds with color photographs that aid in identification and diagnosis. The cost of the 434 pg. book is \$84.50. For more information contact: Krieger Publishing Company, P.O. Box 9542, Melbourne, FL 32902-9542. Tel:(407)724-9542, Fax:(407)951-3671.

**New Guinea Impatiens, A Ball Guide.** Edited by Warren Banner and Michael Klopmeier. Now available, the only guide to growing the popular New Guinea Impatiens has just been released. A complete guide to propagating, growing, handling, marketing, and caring for New Guinea impatiens. Publication is available from Ball Publishing, P.O. Box 9, Batavia, IL 60510-0009; U.S. only. Tel:1-800-456-5380, Fax:1-800-456-0132.

**Ball Perennial Manual-Propagation and Production.** Now available from Ball Publishing. 512 pg. "cultural cookbook" on herbaceous perennials, written by Jim Nau, features 149 genera and 300 species. Covers detailed propagation information, with specifics on hardiness, adaptability, performance and use. Contact Ball Publishing for information, Tel:(800)456-5380, Fax:(800)456-0132.

**National List of Plant Species That Occur in Wetlands: 1988 Virginia.** Developed for the Virginia Nurserymen's Asso., by Cathy Palmintier and Dr. Bonnie Lee Appleton at the Hampton Roads Agricultural Research and Extension Center, Virginia Tech University-1996. Only wetland plants available through the listed nurseries and growers are included. The manual is soft-cover 8 1/2" x 14" with 49 pages of information. Available from the VNA Office for VNA members at \$23 and \$33 non-members. They may be ordered from Virginia Nurserymen's Association, 383 Coal Hollow Rd, Christiansburg, VA 24073-6721.

**The Michigan Nursery and Landscape Association's 1996 Nursery Stock Index.** This publication 124 pages filled with over 5,000 plants listed by category, botanical name, then common name and it is complete with a cross-reference of common and botanical names. Cost is \$25 for

non-members. For more information, call the MNLA office at 1-800-879-6652.

**Greenscape.Net.** On-line Network for the Professional Green Industry. Introduced at Mid-Am and CENTS Show. This on-line information system has been designed to include information from virtually every association, educational location, and all business's involved in the Green Industry. Greenscape Net is offering a free listing for all associations and will also place companies on the Internet for \$49 per yr. World Wide Web Home Pages are being offered starting at \$295 per year. For more information contact Greenscape Net at 1-800-631-1395, by E-Mail at GREENSCAPE@GARICK.COM or by fax at 216-581-7110.

**How To Exhibit and Sell At Nursery Trade Shows.** This new publication will help to increase sales at each trade show. Learn how to draw these serious buyers into your booth and make the sale. Features include: Staffing an Exhibit, Display of Merchandise, Impressions, Lasting Impact, and Closing the Sale. Cost \$25 + \$3 shipping for State Association members, \$35 + \$3 shipping for non-members. For more information contact: Wholesale Nursery Growers of America, 1250 I Street, NW, Suite 500, Washington, DC 20005. Tel:(202)789-2900, Fax:(202)789-1893.

**Growing Degree Day Subscriber.** The Southeast PA IPM Research Group has set up temperature monitoring sites in order to provide Growing Degree Day information for the ornamental horticulture industry in southeast PA. Insect and plant phenological activity is also being monitored and reported. The information is collected from 27 cooperators in 9 counties in southeast Pa and DE. As a pest report subscriber you will receive the actual data that is reported every week. Information will help you with monitoring. Cost is \$30 for one season, starting 3/1/96 - 10/31/96. For more information contact: Montgomery County Cooperative Extension, 1015 Bridge Rd., Suite H, Colledgeville, PA 19426-1179, Tel:(610)489-4315.

**OSHA Compliance Manual.** This publication is your one stop source to fully cover the numerous and complex OSHA regulations. AAN's manual walks you step-by-step through issues including: Recordkeeping, Facility Design/Emergency Plans, Facility and Grounds management. The manual is available exclusively from AAN. Cost is \$131 for AAN member, \$155 for non AAN member. For more information contact: American Association of Nurserymen, 1250 I Street, NW, Suite 500, Washington, DC 20005. Tel:(202)789-2900, Fax:(202)

**April 10** - Southeast Regional Christmas Tree Growers Meeting, 7:00 pm, Berks County Agricultural Center.. For more information call: Tel:(814)863-0471, TDD(814)865-3175.

**April 11-12 and June 3-4** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Wetland Evaluation Methods.** Location: Patuxent NWRC, Laurel, MD. 8 am - 5 pm. \$475.00/4 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**April 16** - Kent County Greenhouse Twilight Meeting. Common Sense Disease and Insect Controls; Budgets for Greenhouse Production; Developing New Summer & Fall Markets. 5-7 pm. Contact Liz Patterson (302)697-4000.

**April 16** - Longwood Graduate Fellows' Thesis Research Presentations: **Risky Business: Risk Management Programming For Public Gardens,** Kara L. Newport Paige. The presentation at the University of Delaware will be approximately one hour in length, from noon until 1:00. Location: Fischer Greenhouse at the University of Delaware. Contact the Longwood Graduate Program Office (302)831-2517.

**April 17** - D.A.N. Board Meeting, Dover, DE. Call Marianne McGloin (302)677-1895.

**April 18** - Sussex County Greenhouse Twilight Meeting. Common Sense Disease and Insect Controls; Budgets for Greenhouse Production; Developing New Summer & Fall Markets. 5-7 pm. Windsor's Greenhouse in Laurel, DE. Contact Jay Windsor (302)856-7303.

**April 18** - Longwood Graduate Fellows' Thesis Research Presentations: **Regional Interpretation Linking Our Natural & Cultural Identities,** Gary W. Schwetz. The presentation at the University of Delaware will be approximately one hour in length, from noon until 1:00. Location: Fischer Greenhouse at the University of Delaware. Contact the Longwood Graduate Program Office (302)831-2517.

**April 19-20** - UDBG Plant Sale, Fischer Greenhouse, Newark, DE. Call (302)832-2531.

**April 19** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Wetland Planting Techniques**. Location: St. Michaels, MD, 8 am - 5 pm. \$175.00/2 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**April 19** - Longwood Graduate Fellows' Thesis Research Presentations: **Regional Interpretation Linking Our natural & Cultural Identities**, Gary W. Schwetz. **The Role of Public Horticulture in Theme Parks**, Diane L. Scheu. **Ricky Business: Risk Management programming For Public Gardens**, Kara L. Newport Paige. **Public-Private Partnerships As Management Alternatives**, Steven L. Chamblee. All presentations at Longwood Gardens will be from 9:30 - 11:30 in the Visitors Center Auditorium. Attendees enter the auditorium through the Garden Shop. Contact the Longwood Graduate Program Office at (302)831-2517.

**April 20** - Rare Plant Auction at National Arboretum, sponsored by the Friends of the National Arboretum, Washington, DC; Contact:202-544-8733.

**April 24** - MidAtlantic Interior Landscape Conference. Longwood Gardens. Call (610)378-1327.

**April 26** - Delaware Center for Horticulture's Rare Plant Auction, Longwood Gardens. Contact Melinda Zoehrer (302)658-6265.

**April 26** - Arbor Day - Donating a tree in your local community or school is an excellent opportunity for your company to elicit some free advertising and create good will for your firm in your local community.

**April 29-30 and August 15-16** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Wetland Horticulture**. Location: St. Michaels, MD, 8 am - 5 pm. \$225.00/4 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**May 2** - Longwood Graduate Fellows' Thesis Research Presentations: **Public-Private Partnerships As Management Alternatives**, Steven L. Chamblee. The presentation at the University of Delaware will be approximately one hour in length, from noon until 1:00. Location: Fischer Greenhouse at the University of Delaware. Contact the Longwood Graduate Program Office (302)831-2517.

**May 6-10 and June 17-21** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Wetland Delineation**. Location: St. Michaels, MD, 8 am - 5 pm. \$775.00/10 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**May 23-25** - People-Plant Council National Symposium, San Antonio, TX; Contact: Diane Relf, Virginia Tech, 540-231-6254.

**May 30-June 1** - American Horticultural Society 51st annual Meeting: Celebrating the American Garden, St. Louis, MO; Contact: (800)777-7931.

**May 31** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Wetland Botany**. Location: Adkins Arboretum, Queen Anne, MD, 8 am - 5 pm. \$125.00/2 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**June 5-7** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Wetland Mitigation**. Location: Patuxent NWRC, Laurel, MD, 8 am - 5 pm. \$575.00/6 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**June 13-15** - Millersville Native Plant Conference. Millersville, PA. Contact Continuing Education Office (717)872-3030.

**June 29 - July 2** - American Association of Nurserymen, GCA Retail Specialty Tour, San Francisco, CA.

**July 9, 11** - Annuals, Bulbs and Grasses for the Landscape. Ornamentals Short Course Series, Research and Education Center, Georgetown, DE, 6-8 pm, Contact Susan Barton (302)831-2531.

**July 10-12** - Summer Mants, Baltimore Convention Center, MD. Contact: Carville Akehurst, Tel:(410)256-6474.

**July 14-16** - 1996 Ohio International Floral Short Course Trade Show, Cincinnati Convention Center, Cincinnati, Ohio. For more information contact: Wendy McAtee, Ohio Florists' Asso., 2130 Stella Court, Suite 200, Columbus, OH 43215-1033, Tel: (614)487-1117, Fax: 614-487-1216.

**July 16-18** - Wetland Plant Identification, W & M Virginia Institute of Marine Science, Gloucester Point VA; Contact: (804)642-7395.

**July 22-26** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Field Wetland Botany**. Location: St. Michaels, MD, 8 am - 5 pm. \$600.00/10 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**July 23, 25** - Annuals, Bulbs and Grasses for the Landscape. Ornamentals Short Course Series, Fischer Greenhouse, Newark, DE, 6-8 pm, Contact Susan Barton (302)831-2531.

**July 23, 25, 30** - Diagnosis & Control of Diseases of Woody Ornamental Plants. Ornamentals Short Course Series, Fischer Greenhouse, Newark, DE, 6-8 pm, Contact Susan Barton (302)831-2531.

**July 24-27** - Conference on Landscaping with Natural Plants. Western Carolina University, Cullowhee, NC. Contact: Sue Dietz (704)227-7397.

**July 28-August 3** - Perennial Plant Association Symposium, Denver Marriott Tech Center, Denver, CO., Contact: (614)771-8431.

**July 29-31** - East-Penn Allied Nursery Trade Show. Tel:(717)238-1673.

**July 30-August 2** - Virginia Recycling Association Annual Conference & Trade Show, Roanoke, VA; Contact: (703)549-9263.

**August 2-3** - ALCA Masters in Management for the Landscape Industry, Chicago, IL; Contact: (703)620-6363.

**August 9-11** - SNA Trade Show & Convention, Contact: Danny summers, 404-973-9026, Fax:404-973-9097.

**August 21** - Summer Turf and Landscape Expo, Apgar Turf Farm, Smyrna, DE. Contact Marianne McGloin (302)677-1895.

**August 23-25** - East-Penn Allied Nursery Trade Show, Contact: 717-238-1673.

**September 6-9** - ALCA Interior Plantscape Conference & Trade Show, Opryland Hotel, Nashville, TN; Contact: (703)620-6363.

**September 9-11** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Used for Constructed Wetlands**. Location: St. Michaels,

MD, 8 am - 5 pm. \$350.00/6 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**September 16-20** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Advanced Wetland Delineation**. Location: St. Michaels, MD, 8 am - 5 pm. \$775.00/10 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**September 20-21** - Mid-Atlantic Regional Meeting of the American Assoc. of Botanic Gardens and Arboreta: Securing Our Future. Location: U.S. National Arboretum, 3501 New York Avenue, N.E., Washington, DC 20002. Contact: Carole Bordelon or Susan E. Bentz, Tel:(202)245-2726.

**October 13-15** - Eastern Region International Plant Propagators' Society. Cincinnati, Ohio. Contact: Margot Bridgen, 26 Woodland Rd., Storrs, CT 06268.

**October 29** - CNP Exam. State Dept. of Agriculture, Conference Center, 2320 South DuPont Hwy. Dover, DE 19901. Contact Marianne McGloin (302)677-1895.

**October 29, November 5, 12, 19, 26, December 3** - Drafting Techniques for the Landscape Designer, 103 Worriolow Hall, Newark, DE, 6:30 - 8:30 pm. Contact Susan Barton (302)831-2531.

**November 12-16** - PGMS 84th Annual Conference, Fort Worth, TX: Contact: (410)584-9754.

**November 18-22** - Environmental Concern Inc., 1996 Professional Courses: Wetland Evaluation, Mitigation, Planting Techniques, and Constructed Wetland Site Visits - **Winter Wetland Delineation**. Location: St. Michaels, MD, 8 am - 5 pm. \$775.00/10 credits. For more information please call (410)745-9620; Fax:410-745-3517.

**January 4-6, 1997** - Winter Mants, Baltimore Convention Center, MD; Contact: Carville Akehurst, 410-256-1799, Fax:410-256-2208.

**January 15-16** - Delaware Horticulture Industry Expo. Sheraton Inn, Dover, DE. Contact Marianne McGloin (302)677-1895.

