FROM THE DESK OF THE PRESIDENT

Christopher Valenti
President, D.A.N.

And the winner is . . .

We are pleased to announce the winners of the Delaware Plant of the Year for 1995. the membership of the D.A.N. choose *Coreopsis verticillata* 'Moonbeam' as the herbaceous perennial and *Magnolia virginiana* as the woody plant for 1995. At this point, we are announcing these results to the membership of D.A.N. only, so you will have time to prepare for higher than normal demand during the spring and summer selling season. We advise you **not** to publicize these winners now, because we will be holding a press conference in conjunction with the 1995 Winter Expo in January at which time we will start our D.A.N. Plant of the Year marketing campaign. Also, *Delaware Today* magazine will be running an article in their February issue (available in January) publicizing these plant selections. We will be providing you at cost, professional ad slicks, point of purchase materials, banners and special plant labels to help boost sales of these newly designated plants and other plants as well. We believe this new program of the D.A.N. will help show your business is a cut above the rest and will help you increase market share. I would like to thank Dave Devine, the initiator the Plant of the Year idea, for the many hours he spent tirelessly developing this program. And also thank the Plant of the Year Committee, and the many D.A.N. members who voted on the final selections.

We have received preliminary analysis of the nursery industry survey performed by the Delaware Department of Agriculture. We will have detailed information in the next DAN News regarding this survey and our plants for an industry-wide survey in the near future. We expect the final details of the current survey will show what we all know--That our industry is an important and viable component of Delaware's economy. This data will help show legislators that we should be consulted when pending legislation or funding will have an impact on our industry.

By now you are aware that Linda Pevey has resigned as executive director of the D.A.N., effective in late January. The requirements of the D.A.N. executive director have grown over Linda's tenure, due to Linda's hard work and talent, leaving her little time for her own business. We are currently receiving applications for someone to fill her position. I would personally like to thank Linda for her outstanding level of dedication and professionalism. Those qualities have helped this organization grow and provide many of the programs that benefit our members.

ASSOCIATION NEWS

Linda Pevey
Executive Director, D.A.N.

Congratulations to the following D.A.N. members who recently became Delaware Certified Nursery Professionals (CNP):

Douglas Clark, DE River & Bay Authority, Landscape Specialist
Cameron Marcelle, Vernon Creek Landscaping & Garden Center, Landscape Specialist
Robert Mazzetti, DE River & Bay Authority, Landscape Specialist
David Rutkowski, Joseph Wick Nurseries, Ltd., Nursery Specialist
Joseph Rybicki, Jr., DE River & Bay Authority, Landscape Specialist
John Chase, Green Seasons Lawn & Tree, Turf Specialist

Now is a good time to start preparing to take the CNP exam in March. The Board recently hired a marketing firm to promote the CNP program to the public. You will be hearing and seeing more about this in 1995. We will also promote the benefits your customers receive by doing business with a D.A.N. member.

The Delaware Turf Conference was held on October 19 at the Hockessin, Memorial Hall. Over 100 people attended, which is the most we've ever had. The program was excellent. The attendees were able to learn many new things by attending this D.A.N. event.

On Saturday, September 17, we held our third Research and Education Fund Benefit Auction. This was the first one held at the Delaware Center for Horticulture in Wilmington in conjunction with their Harvest Festival. The plant material and hard goods donated by the membership were fabulous. We made over $3000 for the Fund. Special thanks to Diane Hill for all her hard work in organizing the member donations.

There is now over $7000 in the Research and Education Fund account. It's time to send out a call for proposals. The Board would like to make specific suggestions to researchers about the types of projects it plans to fund. The Board wants this money to address real problems that affect this industry. At the next meeting, the Board plans to discuss possible topics or projects that will be suggested on the call for proposals. If you have a suggestion, please call me or a Board member.

The Members' Crab Feast was held on September 22 at Boondocks Restaurant, east of Smyrna. It's safe to say a good time was had by all. Despite some bad weather, the turnout was great. Members enjoyed delicious crabs and good fellowship. It was a great opportunity to get to know some of the other members of the Association.

The 1995 Plant of the Year program is on schedule for the January announcement of the first D.A.N. Plants of the Year. The plants will be publicly announced during a press conference in conjunction with the Delaware Horticulture Industry Expo. We expect to have good press coverage of these plants, including an article in Delaware Today magazine. Promotional pieces will be available in January.

Put January 18 and 19 on your calendar for the 1995 Delaware Horticulture Industry Expo. As always, we have a great program lined up for you.

If you have not returned your 1995 Dues Renewal from, please do so as soon as possible, so we can get the new directory printed on schedule for the Hort. Industry Expo.

At the end of January, I will be resigning from my position as the Executive Director of the D.A.N. We have received many good applications for the position. The Board will be conducting interviews in December. It is the Board's intent to have the new Executive Director present at the Delaware Horticulture Industry Expo.

U OF D NEWS

Susan Barton
Extension Specialist

Drafting Techniques for the Landscape Designer, the last 1994 ornamental short course, was completed in November. Ellen Baldo conducted a great six-session class that covered both graphics and design principles. Once again, the participants were thrilled with the opportunity to learn from Ellen. Brochures for 1995 Ornamental Short Courses will be mailed soon. We have another good line-up of topics, including a business management class. These short courses were designed to meet your needs. Please register. If you can not register for one or more or these short courses, tell us why. We must structure this program to meet your needs.

The Ornamentals Research Expo was conducted on September 13th from 4 to 8 PM. Participants spent over an hour looking at research plots and asking questions about current ornamentals research projects. They enjoyed a great dinner of assorted subs and received a new, interesting or unusual plant from John Frett to take home and evaluate.

The Delaware/Maryland Ornamental and Turf Workshop was held on November 30. Judging by the turnout, you were all there. The speakers were great and topics interesting.

I am continuing to provide information (see following article) on the Garden Council's Promotion Order for the nursery industry. This is a hot topic, with new developments occurring all the time. I see my role as provider of information. If you have questions about the technicalities or ramifications of the promotion order, please call.

I look forward to seeing you at the Delaware Hort. Industry Expo on January 18 and 19.

PLANTS FOR AMERICA: GARDEN COUNCIL PROMOTION ORDER UPDATE

Editor's Note: The following is information provided by AAN and the Plants for America Garden Council to explain the proposed promotion order and help you make an educated decision about its usefulness to the industry.

The AAN Board of Directors is looking very positively at the Garden Council' "Plants for America" Promotion Order, given recent developments, and are moving ahead to survey the entire AAN membership on their support for the proposed program.

Two recent developments give the AAN Board of Directors a basis for looking favorably at the promotion order: First a recent survey of AAN Governors and Lt. Governors indicated that over 70% of respondents personally support the promotion order concept, while only 10% indicated opposition.

Second, the Garden Council has announced its intention to collect the promotion order assessment through the industry's container and burlap supplier channels. The Board sees this assessment system as a far more efficient, effective, and equitable system of collection, compared to invoicing growers based on their sales volume. This change in the promotion order's collection system must now be communicated to the industry. Therefore, the Garden Council's opinion survey of the industry growers has been scheduled for late December 1994.

As promised in the August 29 issue of *Update,* the Board is surveying the entire AAN membership to gauge its support for the promotion order. The results of this survey will be considered by the Board in November as they make a decision regarding whether or not to formally endorse Plants for America.

Reprinted from *Update*, an official publication of the American Association of Nurserymen, October 24, 1994.

The latest news flash dated November 21, 1994 follows:

Garden Council CEO Gary Mariani announces promotion order action steps that were formulated at the Nov. 18, 1994 meeting in Dallas by growers and manufacturers/distributors of containers. The action steps will be enacted in order to maximize the results of an upcoming industry-wide survey. The industry survey which will assess the knowledge of and preferences for the "Plants for America" promotion order was postponed until March of 1995. It was previously scheduled for December of 1994. The additional time will allow for the following:

- An industry task force will accurately size the container market in order to derive the appropriate check-off percentage needed to raise $25 million. This information will allow the grower--at the time of the survey--to know exactly what it will cost if the promotion order is enacted.
- Certain industry segments and geographic regions are still unaware of "Plants for America." The extension will provide the opportunity to reach these groups.
- By March, the Garden Council should have a comprehensive list of growers. new sources for lists of growers have been identified, and an aggressive outreach program designed to identify almost every segment and geographic region will be instituted.

The Executive Committee of The Garden Council believes this change in schedule is consistent with the goal of including as many companies as possible in the promotion order process to provide enough information for educated decisions.

WORKER'S COMPENSATION, PART II

Susan Barton
Delaware Cooperative Extension

I was prompted to investigate the changes in Delaware's Worker's Compensation law after reading Bill Allen's two-part article in *The Rhode Island Nurserymen's Newsletter* (first part appeared in D.A.N. News, June 1994) and an article in Russ Powell's *Green Business Reporter* from Penn State Cooperative Extension.

Bill Allen describes a system in Rhode Island in which compensation systems spiraled out of control. Benefit levels were increased to the point that many injured workers were able to collect nearly their full take-home pay while on workers' compensation, thus eliminating the incentive to get back to work. At the same time, medical care costs increased significantly. What had been a profitable line of business for insurance companies now quickly became a loser and the legislated benefit levels offered little promise of a return to profitability. Companies stopped writing the coverage and forced the majority of businesses into the assigned risk plan.

The worker's compensation assigned risk plan is a mechanism that was set up so all insurance companies would share in the premium and losses for the group of businesses that were not insurable as regular businesses. Unfortunately, while it provided a much needed outlet for insurance, the assigned risk plan also was a disincentive for companies to aggressively pursue claims and loss control. This had the effect of increasing the amount of claims paid out which drove up the insurance rates.

In 1992, Rhode Island enacted legislation to control the runaway worker's compensation system. Wage payments were limited to 75% of net pay and could not include overtime.

John Yasik from Poland and Sullivan Insurance Co. provided the following update on Delaware's new worker's compensation law. In July, 1993 (effective 8/1/94) Governor Carper signed legislation to invoke a competitive rating system. In the past, the Rating Bureau established rates and business owners would receive the same quote from any insurance company. With this new law, the Rating Bureau establishes guidelines or advisory rates but insurance companies have the opportunity to quote competitive rates. This competition should work to the benefit of business owners.

With the new law, the Rating Bureau increased the level of the advisory rates. The last rate increase had occurred in 1986. Since the competitive rate system is so new in Delaware the differences in current rates between insurance companies are probably minimal. But small business owners should look to shop around for worker's compensation insurance in the future.

Delaware's law also specifies that employees receive only 66 2/3 percent of wages prior to injury. Hopefully, Delaware businesses will avoid the problems faced by business owners in Rhode Island.

Russ Powell's article from Pennsylvania Cooperative Extension brings up an important point for owners of nursery/landscape businesses. Pay attention to the job classification of your employees. Worker's compensation rates are higher for tree worker's than for general landscapers. If you do tree work, be sure you are paying the proper rates so you won't have problems filing claims if and when they occur.

Portions excerpted from *The Rhode Island Nurserymen's Newsletter*, June 1994, No. 16.

MARKETING AND COMMUNICATIONS SURVEY OF REPRESENTATIVE D.A.N. MEMBER FIRMS AND THEIR CUSTOMERS

Barbara and Dave Lundquist
Bernard, Peet & Co.

Business view of customer's perceptions

Several things were immediately apparent. Among the businesses, the customer perception of the firm's professional skills was unanimously deemed of utmost importance. Most thought that their most serious competition came from other professionals, rather than non-professionals or chains.

A majority felt that DAN's greatest value to their business was technical information and networking with other professionals. Many designated their membership in DAN in their printed materials, particularly among the garden centers and commercial landscapers. (Designation in Yellow Pages appeared to be too much of an extra cost to most of the businesses).

Business view of D.A.N. membership

A great majority of DAN members surveyed felt that the technical information they received through their DAN membership was most helpful to them. Others offered marketing information as the second most important aspect. Others mentioned that the networking with other professionals was very important, while still others mentioned the credibility as most important. That credibility at this point in time, would apply most among other professionals, as the public as we shall see, does not understand the professionalism that comes with the DAN membership.

Customer opinions

Across the board, very few knew of the DAN or the CNP program. All valued tremendously, the professional knowledge and skills of their professional nurserymen -- and any continuing education efforts. Most assumed that their suppliers were so professional that they must be keeping up with educational efforts. These customers were especially chosen because they were serious, informed customers, who knew enough to choose professional nurseries. All had nothing but praise for their suppliers.

Most we contacted got 90-100% of their plant materials from professionals. Criteria most mentioned for their choice was quality service, quality plant materials -- as well as personally liking their suppliers. Educated informed advice was usually mixed in there, as well. Most people stopped in the first time to check out the business, liked the people and the advice, and have remained with that supplier. When asked if they had ever encountered problems, most replied with an emphatic, "No!" Most said, in essence, "When I deal with a professional, it works for me as a consumer."

About half of the customers felt that continuing education by their suppliers was beneficial to them, as customers. The other half had so much faith in their supplier, they really didn't care. None were aware of their supplier's DAN membership, or the CNP program. (It should be noted at this point that few customer knew what DAN membership meant at this point).

Basic message strategy based on results

The initial basic message strategy will be to inform the consumers of the value of dealing with professional nurserymen -- and members of the DAN. It will be underlined in all communications developed. Once the value and

benefit of professionalism is established in the customers' minds, we can then build on the value of the CNP Program, primarily but not exclusively, within the industry. Only after the consumers are aware of the value that DAN professionals bring, can we begin to address the industry about the value of the CNP program.

Marketing D.A.N. vs. the C.N.P. program

After conducting the survey and evaluating the results, it has become clear to us that in order to increase participation in the CNP program, the following needs to happen:

1. The existing customers must first understand the value they receive from choosing DAN professionals overall, before we address the public in general. They will pass the word along to other serious gardeners.

2. Care must be taken to include all appropriate measures of personal competence, so as not to alienate the professional nurseryman who has succeeded through years of professional experience and standards, gathered without CNP accreditation.

3. DAN needs to formally establish professional standards to support the DAN membership in their effort to promote professional nursery quality standards prior to promoting the CNP program, based on individual standards of excellence.

4. Greater visibility and understanding about DAN needs to happen before DAN members or their customers can appreciate the value that personal competence demonstrated by a CNP designation brings.

Action for DAN member firms

Given the complete lack of knowledge on the part of the public about DAN, we feel strongly that the basis of the public campaign be on the benefits the customer receives when choosing a DAN professional as the preferred supplier. DAN member firms must communicate the DAN values to their customers. They should use methods we can absolutely control such as; direct mail, point-of-purchase materials and face-to-face discussions; rather than the media to deliver this message. It is too costly to create understanding of a product, service or organization through the general media. Once an understanding is built, the media can be used to reinforce the message.

The DAN marketing program will provide some promotional pieces for members to use to tell the DAN story. A point-of-purchase leaflet might be used to inform the customer that they have purchased materials from a DAN member. In the leaflet, the benefits of buying from a professional nurseryman well be described in terms that relate to the customer. The materials could also be sent by the nurseryman to his preferred custoemrs in a direct mailing. A series of brochures will be produced that have a “family” design, so customers will begin to recognize them as coming from DAN.

IPM IN THE GARDEN CENTER

Chuck Cornell
Nursery IPM, Inc.

Many nurserymen are beginning to realize that the most effective and environmentally sound way of managing pests in production areas is by using IPM. IPM also works in the garden center and provides a high level of pest control in the safest way possible for retail sales areas. This is an important point to consider seriously because in the garden center customers are exposed directly to pesticide residue on the plants every time they touch a plant or make a purchase. How many times have you seen children touch plants or put leaves or flowers in their mouths? Or had customers ask what that smell was the day after you sprayed? These are not pleasant thoughts if you've been spraying a skin irritant like Mavrik or a pesticide with a lingering chemical odor like Dursban. This alone should convince garden center operators to minimize pesticide use and use biorational pesticides more frequently. A well run IPM program in the garden center can not only improve pest control but also make it a safer place for your customers and employees.

The key element to effective use of IPM in the garden center is regular monitoring - looking at plants on a regular basis for signs and symptoms of pest problems, beneficials, and conditions that could contribute to pest problems. The IPM coordinator monitors all plants regularly, weekly, or more often during April and May when aphids and other pests abound. All employees can easily become effective IPM scouts because they are constantly looking at plants - whether moving them or watering them or during a sales presentation to a customer. Only a small amount of training is necessary to make all garden center employees useful IPM scouts. Not everyone has to know everything, no one ever will, but all employees can certainly be trained to identify such common pests as aphids, spider mites, lacebugs, bagworms, powdery mildew and Japanese beetle. A short weekly meeting with live samples or 35 mm color slides should provide the appropriate level of training. Employees can then report their observations to the IPM coordinator for further review and pest management action.

Pest management in many garden centers means spray all the plants every week with tank mixes of broad spectrum pesticides hoping to kill whatever pests might be on the plants without knowing what's really there, if anything is, and then hoping you kill it before it does much damage to the plants. This approach is like a fire department spraying all the buildings in their territory every so often in case one of them is on fire. It doesn't make sense for fire control and even less sense for pest control in the garden center. This type of cover spray guess work is unnecessary in an IPM program because regular monitoring of plants ensures that pests are detected and identified and can be dealt with on an individual basis before significant plant damage can occur. For example, if there are aphids on the S*pireae*, does that mean there are aphids on the junipers? If the *Buddleia* have spider mites do all the perennials need to be sprayed with a miticide? If one Mugo pine has pine needle scale, should the azaleas and peonies also be sprayed? Why guess, why wonder, why waste time and money and jeopardize employee and customer safety by spraying pesticides unnecessarily? Just look at the plants, identify the problem areas and spray those.

Chronic pest problems and fatal attractions may require a preventative approach. For example, preventative fungicide applications may be necessary for plants highly susceptible to powdery mildew. Most varieties of roses are best sprayed weekly against the common rose diseases. Everyone knows that Arecia palms are going to get spider mites sooner or later and by then it will be too late so it may be best to use a miticide on these plants when spider mites first

appear. These fatal attractions are well known to experienced garden center operators.

Many biorational pesticides are available that can be used effectively in the garden center. Insecticidal soap gives great control of aphids, whiteflies, thrips, and more. Hort oil can be used against these same pests as well as scale insects and spider mites. Several newer botanical pesticides derived from Neem tree extracts are effective against thrips, whiteflies, and fungus gnats. These pesticides are very safe for employees and customers. Avid gives good control against thrips, whiteflies, and spider mites. Formulations of Bt can be used effectively against caterpillars and fungus gnats. Two exciting new pesticides, Marathon and Merit, may be applied to the soil for true systemic long term activity against many common pests of the greenhouse and nursery. These work much the same as Temik and Vydate/Oxamyl, but without the fear engendered by these highly toxic and dangerous pesticides. When pests get out of hand, as they sometimes do, synthetic organic pesticides can be used to knock populations back to nondamaging levels.

Biocontrol may also be used in certain situations if closely and thoughtfully managed. For example, effective aphid biocontrol can be established by allowing large display plants to harbor light infestations. Biocontrol agents such as parasitic wasps and aphid predators can develop on these aphids and move to stock plants when aphids are present there. Spider mite predators may be used the same way. Useful predators of spider mites, aphids, and mealybugs are commercially available. Using biocontrol clearly requires intelligence and close observation and may not always be the best choice.

Pest problems can be reduced or eliminated by thoughtful placement of plants. For example, plants that are susceptible to spider mites should not be placed near a dusty road with lots of vehicle traffic. Spider mite populations tend to build up on hot dusty plants. Plants susceptible to powdery mildew and other foliar diseases should be placed in open sunny areas, or if placed in the shade as part of a display, they should be well spaced to allow air movement and to reduce moisture on foliage. Intelligent watering practices can minimize diseases by allowing foliage to dry rapidly during the day and not remain wet at night.

Garden center pest management can be safe and effective by using basic IPM techniques. Thoughtful and creative garden center operators can give their customers attractive plants and a safe pleasant environment to purchase them.

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

AMENDING NURSERY SOILS WITH BIOSOLIDS

Francis R. Gouin
University of Maryland

We recognize that with the harvest of every crop of balled and burlapped or balled and potted nursery plants, nurserymen remove from their nurseries 200 and 250 tons of top soil per acre.

This is a tremendous loss of top soil which can never be replaced. Many nurserymen have told me that without spending time and money to replenish the organic matter lost in harvesting, either through green-manure crops or animal manures, it generally takes a year longer to grow the next crop. This means that after harvesting five crops, you have extended the growing period for the next crop by five years.

Many nurserymen inform me that they cannot afford the time or the space to rejuvenate their depleted soils with green-manure crops between nursery crops. Land is too precious and they don't have the labor available. Therefore, to maintain a production schedule, they must spend more money on lime and fertilizers in an effort to make up the differences in growth rates.

The importance of organic matter to soils is well recognized but grossly underestimated. We know that in addition to generating nutrients in a slowly available form, organic matter reduces the bulk density of soils and increases the cation exchange capacity (CEC) as well as the water holding capacity of soils. As we study the interaction of organic matter with plant growth, we can now say with great certainty that the presence of organic matter in soils helps to reduce diseases, nematodes and insect problems. These pluses go unnoticed, because we have increased our dependencies on fertilizer and pesticides. As we study environmental issues such as chemical pollution, ground water contamination, and efficient use of natural resources, can we truly state that we are utilizing sound agricultural practices?

One source of organic matter that nurserymen should be utilizing more is biosolids (sewage sludge) from waste water treatment plants. Most waste water treatment facilities will gladly apply the biosolids on your land at no charge and even plant a cover crop. Most of the biosolids in the state of Maryland are of Class A, meaning low in metals.

Direct injection of biosolids is an effective method of applying biosolids and will not create odor problems. The three wheel vehicles that apply biosolids have large, wide wheels, to minimize soil compaction, and are computer controlled for pin-point accuracy.

Direct application of biosolids is the most effective and least costly means of recycling biosolids. Biosolids injected by this method contain 80 - 85% water and may contain up to 4% nitrogen (N). The amount of biosolids applied on land is dependent on: the CEC and nutrient concentration of the soil as determined by soil testing; the nitrogen needs of the succeeding crop; and the nutrient and metal concentration of the biosolids. Since most of the biosolids generated in Maryland are Class A, the amount of biosolids applied are primarily dependent on crop use and soil CEC. In general, biosolids application rates vary from 15 to 20 tons per acre per application. These application rates would provide 600 to 800 lbs. of total N per acre with a mineralization rate of 14%. This means that it will release 80 to 112 lbs. per acre of available N at soil temperatures of 72' F or higher. In addition to supplying N you would be obtaining all important plant nutrients, including trace elements plus organic matter. In most instances, it will come to you free of charge including application. What more can you ask for?

The biosolids application should be immediately followed by a planting of sorghum or Sudan grass. By using this practice, all available N will be immediately utilized by these plants and returned to the soil as a cover crop. Therefore, nurserymen clearing a field of nursery plants this spring or summer could rejuvenate the soils rapidly during the rest of the summer by having biosolids injected into their soils, grow a short term cover crop, and have the ground ready for planting by fall or early spring. Such a cycle would provide adequate time for the biosolids to stabilize and begin to mineralize, and the cover crop would capture available nutrients present in the soil and those released by the biosolids. If the land is not to be planted into nursery stock until spring, then a winter wheat or winter rye cover crop could be planted in the fall to assure ground cover during the winter months.

If loading limits are your problem, forget about it. Since the process of digging plants removes 200 to 250 tons of top soil with the harvest of every acre of plants, it is highly unlikely that metals will ever accumulate in nursery soils from the application of 15 to 20 tons of biosolids per acre. In my opinion, nurseries growing field grown plants offer the safest soil to which biosolids can be added without ever exceeding loading limits.

This is especially true if you subscribe to the philosophy that "the solution to pollution is dilution." Let's spread it around and let everybody benefit from it. The nursery industry offers a great margin of safety with regards to the utilization of biosolids and composted biosolids.

Reprinted from *Free State Nursery News*, August, 1994

MULCH TOXICITY

Jeff Iles
Iowa State University

An organic mulch, such as wood chips or shredded bark, is one of the best and least expensive soil and root enhancers available. A layer of mulch spread over the root-zone of trees and shrubs prevents water from evaporating from the soil before plants can absorb it, moderates extremes in soil temperature, improves soil structure, and contributes mineral elements to the soil. But recently, several nursery and landscaping professionals have reported leaf scorch, chlorosis, and even plant death after using organic mulches around landscape plants. Excess amounts of fertilizer or pesticide misuse is often blamed for this type of plant injury, however, improperly stored organic mulch may be responsible for these symptoms. Mulch stored in piles at the nursery need to "breathe" to prevent infestations of anaerobic (low oxygen) micro-organisms that produce toxic fermentation substances, such as methanol, acetic acid, ammonia gas, and hydrogen sulfide gas. The larger the pile and the less frequently it is "turned" the more likely the center of the pile will become anaerobic, producing sour or "acid" mulch.

Bedding plants and low-growing woody plants like barberry and spirea are the most frequently damaged by sour mulch, usually exhibiting white marginal leaf chlorosis or leaf scorch, defoliation, and occasionally, entire plant death. These symptoms may appear several days after the mulch has been applied, but often the effects of sour mulch are immediately apparent. And because toxins produced by sour mulch usually dissipate by the time plant injury is noticed, the problem is difficult to diagnose.

How can you determine if organic mulch has soured? The simplest and most cost effective

test is to smell it. Sour mulch usually has a strong, penetrating odor much like vinegar, ammonia, sulfur, or silage. By contrast, properly stored mulch will smell like freshly cut wood or fertile garden compost. Another way to identify sour mulch is to test its pH. Sour mulch will have a pH of 1.8 to 2.5!

Mulch can be safely stored in bins if the material is used fast enough to empty the bin before it is refilled. Never dump fresh mulch on top of an existing supply. If the old mulch is sour, it can quickly sour the new material.

Store mulch on a crowned surface that allows moisture to drain away from the area. Air movement is restricted in mulch that is excessively wet, making it more prone to souring.

Mulch is best stored in windrows that are 4 to 6 feet tall and 6 to 12 feet wide at the base. As you form the windrows, avoid driven equipment onto the mulch piles because it causes compaction and subsequent fermentation.

Mechanically turn or mix stored mulch regularly. Turning mulch piles once or twice a month will introduce air into the pile and reduce the chance for anaerobic decomposition. But, if the mulch is extremely wet, the mulch will require more frequent turning.

Can bagged or packaged mulch turn sour?
Yes! In fact, the potential for sour mulch might be greater for organic mulches stored in plastic bags than mulch stored in the open. The risk of sour mulch can be reduced by making sure that the plastic bags have air holes that allow the mulch to breathe. Finally, do not create huge mountains of bagged mulch. Bagged materials are best stacked on wooden pallets with space between the stacks for ventilation.

Reprinted from the Iowa Nursery & Landscape Association News, August/September 1994

THE BEST WAY TO HEAD OFF ONEROUS ENVIRONMENTAL REGULATIONS

Tom Yeager, University of Florida
Donna Fare, Tennessee Tech University
Charles Gilliam, Auburn University
Alex Niemiera, Virginia Tech

Most likely you have used several Best Management Practices for some time, even though you may not have thought of a particular production practice as a Best Management Practice.

Best Management Practices (BMPs) have been used for several years in rowcrop agriculture. For example, cover crops are plowed into soil to improve fertility and soil structure, legumes are planted to enhance soil nitrogen, and terraces are used to prevent soil erosion.

Why do BMPs for the nursery industry need to be developed? More questions are being asked about the impact of agricultural production practices on the environment. Consequently, more regulations exist today then 10 or 20 years ago, and even more regulations are likely in the future.

The federal Clean Water Act and Coastal Zone Management Act were passed by Congress in 1972 and are being reviewed by Congress now. Maybe you have not been impacted directly by this legislation, but concern exists about future regulations and their impact on the nursery industry. For example, did you know that management measures required by the Coastal Zone Act Reauthorization Amendments of 1990 are applicable to container nursery crop production?

Even though you may be using some production practices that could be called BMPs, there is a need to document the use of these production practices and provide the industry with an additional menu of voluntary production practices or BMPs. Use of BMPs developed by industry and university personnel may help preserve the environment and head off additional regulations.

Industry should regulate itself

To begin the process of developing BMPs for the nursery industry, a discussion group gathered last May in Atlanta, Ga. Attending were industry leaders from southern states; representatives from the Alabama Department of Environmental Management, Florida Department of Environmental Protection, U.S. Environmental Protection Agency and Virginia Soil Conservation Service; and representatives from southern universities. The purpose of the meeting was for industry and university leaders to receive input from these regulatory agencies regarding whether BMPs are needed, and if so, what production practices should be addressed.

Regulatory agency representatives indicated the nursery industry should regulate itself by using BMPs. If the industry failed to do so, regulatory agencies would intervene.

The meeting concluded with industry representatives requesting that a core group of university personnel from the southeastern United States, with cooperation from representatives of the nursery industry and regulatory agencies, develop a BMP handbook for the southeastern nursery industry.

How the system would work

BMPs would be voluntary, result in improved water quality, meet state and federal environmental guidelines and allow nurseries to compete in the market.

BMPs could be used:

- As guidelines for growers attempting to reduce environmental impacts of their operation.
- For growers wanting to promote the fact that they are environmentally friendly.
- As guidelines for growers responding to an environmental issue or complaint.

BMPs will be developed as a cooperative project between the nursery industry, governmental agencies and universities. Research results used as a basis for BMPs will be interpreted by university personnel for their applicability as a BMP for the Southeast.

A handbook format with short, to-the-point statements or a menu of production practices will enable users to quickly locate topics and answers to questions about BMPs. Nursery operators could use the handbook as a source of immediate answers to irrigation and fertilization questions. The handbook will include references and illustrations that support BMP recommendations.

A list of possible Best Management Practices

1. Collect runoff water when injecting fertilizer.
2. Apply fertilizer only when growth response will be obtained.
3. Do not broadcast fertilizer on spaced containers.
4. Do not top-dress fertilizer on containers prone to blow over.
5. Water and fertilize according to plant needs.
6. Group plants in nursery according to water and fertilizer needs.
7. Monitor quantity of irrigation applied to prevent overwatering.
8. Maintain minimal spacing between containers receiving overhead irrigation.
9. Use low-volume irrigation on containers larger than 7-gallon.
10. Recycle runoff water.

Reprinted from *Nursery Manager--Growers' Special* 1994.

COMMERCIAL PRODUCTION OF HOLIDAY CACTUS

Thomas H. Boyle
University of Massachusetts

Wow, it's too late for holiday cactus! Not really! Propagation is from December to March for November and December sales. Rooted cuttings are potted up beginning in April. Read on!

Introduction. Holiday cactus is a popular flowering pot plant that is grown mainly for fall and winter sales. Its cultural requirements are relatively simple, and once mastered, highly marketable flowering plants can be produced.

Holiday cactus is sometimes marketed as Christmas cactus, Thanksgiving cactus, or Zygocactus. The "true" Christmas cactus is an interspecific hybrid of *Schlumbergera truncata* and *Schlumbergera russelliana* that originated about 150 years ago in England. It is a common houseplant but is not often grown commercially. Plants have segments with rounded margins, ribbed ovaries, and purplish-brown anthers. The correct latin name for Christmas cactus is *Schlumbergera* x *buckleyi*; the "x" indicates that it is an interspecific hybrid. Most commercial cultivars of holiday cactus are actually *Schlumbergera truncata*, commonly known as Thanksgiving cactus or Zygocactus. Thanksgiving cactus flowers about 4 to 6 weeks earlier than Christmas cactus. Some cultivars of holiday cactus are derived from crossing Christmas cactus and Thanksgiving cactus, and have characteristics that are intermediate between the parents.

Cultivars. Many cultivars of holiday cactus are grown commercially. Cultivars differ in the following respects: 1) degree of branching; 2) plant habit (pendulous, semi-pendulous, or erect); 3) rate of vegetative growth; 4) shape of segments and flowers; 5) flower color; and 6) time of flowering under natural photoperiods. Table 1 describes several holiday cactus cultivars that are grown commercially.

Flower color and number of flowers per pot (basket) are the main criteria that consumers use to evaluate holiday cactus. Commercial growers should select cultivars that perform well under their environmental conditions. Most of the commercial cultivars are patented varieties. Growers must sign a license agreement in order to propagate patented varieties.

Propagation. Holiday cactus is propagated by rooting mature, single-stem cuttings obtained from vegetative stock plants. Remove cuttings from stock plants by twisting 180^{o} and pulling upwards. Use mature terminal and subterminal segments for propagation. collect cuttings in clean, pathogen-free containers. Surface-disinfect cutting with a five-minute dip in diluted bleach (6.5 fluid ounces Chlorox per gallon of water) followed by a thorough rinsing in tap water. Cuttings can be stored for up to three months, and the optimum storage conditions are 50-59^{o}F and 85-95% relative humidity. Purchase unrooted cuttings from plant brokers or specialist propagators.

Propagate cuttings in cell-packs or 1 1/2-2" pots, using 2 to 4 cuttings per cell (pot). The rooting medium should be pathogen-free, well-drained, and maintained between 70^{o} and 75^{o}F during propagation. Segments will root equally well using intermittent mist, high-humidity tents, or periodic hand-watering, as long as the rooting medium remains moist and warm. Conditions during propagation are highly conducive to the spread of an infection by disease-causing organisms. Strict sanitation will reduce the incidence of disease and minimize the need for fungicide applications.

Propagate cuttings between December and March for sales during November and December.

Cuttings propagated during naturally short days (SD) from mid-September until late March should be given long day (LD) photoperiods to promote vegetative growth. LD photoperiods can be provided using "night-break" lighting from 10 pm to 2 am at 5 to 10 footcandles minimum light intensity at plant level.

Stimulation of Multiple Shoots. Newly-propagated cuttings will often produce only 1 or 2 new shoots. Multiple shoots can be obtained from rooted cuttings by twisting off all of the new segments. Segments should be removed about 6 weeks after sticking cuttings when the largest new segments are about 1/2" long.

Transplanting. Transplant plants that are propagated between December and March into the finishing container during April, May, or June. Use 1 cell per 3 1/2-4" pot, 3 cells per 5-6" pot, 4 cells per 6" hanging basket, and 8-10 cells per 8" hanging basket. Plants can be grown at pot-tight spacing during most or all of the growing period.

Commercial growers may purchase liners for finishing in larger pots. Liners of patented and non-patented cultivars are available through plant brokers and specialist propagators.

Irrigation. Plants should be irrigated in order to retain a moist growing medium for maximum growth. The frequency of irrigation will vary depending on the environmental conditions, type of growing medium, and plant establishment. Well-established plants may need to be irrigated every 2 to 3 days in sunny, warm weather, or every 5 to 8 days in cool, cloudy weather. Recently-potted plants should be irrigated less frequently than well-established plants. In general, holiday cactus will tolerate underwatering better than overwatering.

Fertilization. Holiday cactus has a relatively low nutritional requirement. Constant fertilization with ≈ 150 ppm nitrogen(N) using a balanced NPK fertilizer containing micronutrients will result in high-quality plants. some growers use calcium nitrate and potassium nitrate to supply 180 ppm N, 390 ppm K, and 53 ppm Ca at each watering, and also apply a balanced NPK fertilizer with micronutrients once a month at 150 ppm N. High-quality plants can be produced using either nitrate or ammonium as the N source. Leach with plain water as necessary to prevent high soluble salt levels. Begin fertilization programs as soon as roots develop on newly-propagated cuttings.

Maintain the pH of the growing medium should be maintained above 5.5 Plants will take up high amounts of iron and manganese when the pH drops below 5.5, leading to serious plant damage. Growing medium samples should be analyzed at regular (≈ week) intervals to monitor the pH.

Controlling Plant Heights. By early September, plants should be: 1) 2-3 segments long in 3" pots; 2) 3-4 segments long in 3 1/2" pots; 3) 4-5 segments long in 4 1/2" pots. Plants that are taller than desired may be shortened by "leveling". Plants are leveled by twisting off terminal segments. Level plants during the first week of starting SD for flower induction.

Flowering Requirements. Flowering of holiday cactus is controlled by photoperiod and temperature. When temperatures are between 50^{o} and 59^{o}F, flower initiation will occur under any photoperiod including continuous irradiation. When temperatures are between 60^{o} and 75^{o}F, plants will initiate flowers under SD but will remain vegetative under LD. Thus, holiday cactus is a SD plant when grown at temperatures ranging from 60^{o} to 75^{o}F. The critical daylength (= the photoperiod separating SD from LD responses) is between 12 1/2 and 14 hours for plants grown at 64-65^{o}F nights and 68-70^{o}F days.

Growers can use natural flowering or controlled flowering for producing holiday cactus.

Natural Flowering. In the northern U.S., most cultivars of holiday cactus will initiate flower buds in September when plants are grown under natural daylengths and temperatures from 60 to 75°F. Flower bud initiation will be triggered when the natural photoperiod becomes shorter than the critical daylength. It is the long nights that trigger flowering, not the short days. Natural flowering occurs primarily from late October to early December in the northern U.S.

Many growers rely on natural flowering rather than controlled flowering for producing holiday cactus. A grower could have flowering plants from October through early January by selecting several cultivars. The disadvantages of this method are that the natural flowering period of individual cultivars is limited, many cultivars would have to be grown to provide a continuum of flowering plants, and year-to-year variation in the time of natural flowering makes it difficult to schedule sale dates.

Controlled Flowering. Holiday cactus can be scheduled to flower year-round by using controlled flowering. This method requires photoperiod control and maintenance of greenhouse temperatures between 60° and 75°F (preferably between 65° and 70°F). During naturally LD (early April to early September in the northern U.S.), flowering can be induced by reducing the hours of daylight to 8 or 9 hours daily (= 16 or 15 hours of continuous darkness). It is important to maintain SD conditions on a daily basis for at least 3 weeks. Take precautions to prevent high temperatures under black cloth. Poor and/or uneven budset may occur if the temperature exceeds 75° during SD. When plants are induced to flower at ≈7 weeks after starting SD, the first flowers will open ≈8 weeks after starting SD.

Delaying Flowering with Long Days. Many cultivars of holiday cactus tend to flower too early for Christmas sales when grown under natural photoperiods. Flowering can be delayed by maintaining plants under LD starting from the first week of September. Night-break lighting with incandescent lamps (≈5-10 footcandles at top of plants from 10 pm to 2 am) will prevent flowering under natural SD. Maintain temperatures above 60° and preferably ≈65° to keep LDs effective. Day-extension lighting (sunset until ≈ 10 pm) will also keep plants vegetative, but night-break lighting is more cost-effective.

Note: Growers considering producing holiday cactus adjacent to poinsettias should be aware that poinsettias require SD for flowering and normal bract coloration, and extraneous light from incandescent lamps may interfere with both processes. Therefore, lighting holiday cactus under black cloth may be required to prevent delayed flowering and/or poor color development of poinsettias.

Irrigation during Flower Induction. Although some growers withhold water from plants in early fall to induce flower bud formation, research has not supported this practice. Water stress during flower induction has been shown to reduce bud set

Postharvest Handling. Foliar application of silver thiosulphate (STS) has been shown to reduce flower bud drop of holiday cactus. An application of 200 ppm STS when buds are 1/4" long will prevent premature bud drop. Growers should be aware that STS is not registered for use on holiday cactus.

Diseases. Holiday cactus is subject to several diseases.

Fusarium oxysporum is a fungus that causes root or stem rots. Infected segments produce reddish-orange sunken spots and then abscise. Orange spores develop in the lesions and are spread easily by water or air. Stems topple over when the basal segment becomes infected. Banrot (40WP and 8G) and Cleary's 3336-F are registered for control of *Fusarium* on holiday cactus.

Phytophthora parasitica and *Pythium aphanidermatum* are fungi that also incite root or stem rots. *Phytophthora* root and stem rot is characterized by necrotic stem lesions with faded reddish borders, grey-green discoloration of the stems, and segment abscission. *Pythium* root and stem rot is similar to the former disease, except that segment abscission is rare. Banrot (40WP and 8G) is registered for control of *Phytophthora* and *Pythium* on holiday cactus.

Bipolaris cactivora (formerly known as *Drechslera cactivora*) is a fungus that causes stem rot. Symptoms include blackened, sunken lesions up to 1/2" in diameter. Black spores develop in the lesions, giving them a fuzzy appearance. Infected segments commonly abscise. Daconil is not labeled for holiday cactus, but experiments have shown that sprays and drenches of this chemical are effective in controlling *Bipolaris* stem rot.

Erwinia carotovora is a bacterium that causes soft rot in numerous cacti, including holiday cactus. The initial symptom is usually a blackened, wet, slimy lesion that develops on the basal segment and progresses upward in the shoot. Plants wilt, collapse, and usually die. Bacteria are spread by splashing water. Since this disease is caused by a bacterium, fungicides will not control the disease.

Insect Pests. The major insect pests of holiday cactus are fungus gnats, thrips, and root mealybugs.

Fungus gnats (*Bradysia* species) are the most common insect pest of holiday cactus. The adults do not cause injury, but the larvae feed on roots and stem tissue. Feeding damage may lead to infection by disease-causing organisms. Fungus gnats can be controlled by avoiding overwatering, reducing algae growth, and applying pesticides that are registered for this pest.

Flower thrips (*Frankliniella* species) have become an important pest of holiday cactus. Thrips are tiny (1/25 inch in length), slender insects that feed on immature segments and flower buds. Feeding causes growth distortion, flecking on fully expanded petals, and bud drop. Both the adults and immature stages are injurious to plants. Heavy infestations may cause severe economic losses. Reduce thrips populations by applying pesticides that are registered for this pest.

Root mealybugs (*Rhizoecus* species) are small insects (about 1/6 inch in length) that infest roots of holiday cactus. Symptoms of infestation include chlorosis of the shoots, reduced plant vigor, and death. Infested roots contain fuzzy, white masses of eggs and females. Prevention is the best method of control. Discarding infested plants and drenching with a registered pesticide will help control root mealybugs.

Reprinted from University of Mass. Coop. Extension. *Floral Notes*, Vol. 6, No. 4, Jan.-Feb. 1994.

CUSHIONING CONSTRUCTION

Heavy vehicles and stored materials are notorious for compacting soil during construction, to the detriment and often the death of present and subsequent plantings. The most frequently suggested preventative is a barrier of some sort around plants, beyond which no trespass is permitted. Such barriers should be no closer to a tree than the tree is high, i.e., 30' away from the trunk of a 30' tall tree.

If barriers are not feasible, a study in California has evaluated several surface protective treatments. These included plywood sheets and gravel and organic mulches, the last two either alone or overlaying geotextile fabrics or plastic grids. A 13,000-pound front-end loader was driven eight times over each plot.

The plywood-protected areas were not protected at all, the soil being compacted as severely as in uncovered control plots. All mulch treatments, however, significantly decreased soil compaction.

The researchers recommended a coarse organic mulch such as shredded tree trimmings, 6" deep or deeper. This can be partially removed for use elsewhere in the landscape when construction is over.

Reprinted from *The Avant Gardener*, Vol. 26, No. 11, September 1994.

TREE SURVIVAL IN FLOODS & ICE STORMS

Susan Barton
Delaware Cooperative Extension

Several recent disasters have provided interesting information about tree tolerance to adverse conditions. The Iowa Nursery & Landscape Assoc. News reported the relative tolerance of these trees to flooded conditions during the 1993 flood.

American Elm	Somewhat Tolerant
Black Cherry	Intolerant
Black Oak	Intolerant
Black Walnut	Somewhat Tolerant
Boxelder	Tolerant
Cottonwood	Tolerant
Downy Hawthorn	Somewhat Tolerant
Green Ash	Somewhat Tolerant
Hackberry	Somewhat Tolerant
Honey Locust	Somewhat Tolerant
Pin Oak	Tolerant
Red Oak	Slightly Tolerant
Shagbark Hickory	Somewhat Tolerant
Shingle Oak	Somewhat Tolerant
Silver Maple	Tolerant
Swamp White Oak	Tolerant
Sycamore	Tolerant
White Oak	Slightly Tolerant

Tolerant - survive more than 150 days of flooding during growing season.
Somewhat Tolerant - some killed by less than 90 days of flooding and some survive more than 150 days
Slightly Tolerant - most individuals survive more than 50 days but less than 100 days of flooding
Intolerant - severe effects with less than 50 days of flooding.

This list was referenced from

Bell, D.T. and F.L, Johnson. *Flood Caused Mortality Around Illinois Reservoirs*. Trans. Ill. State Acad. Sci. Vol. 67 (1): 2837.

Understanding some of the soil, tree and flood characteristics may help in evaluating flood damage. Soil aeration is reduced or eliminated, resulting in poor root growth and eventual root death of trees. Flooding tends to increase the pH of acidic soils and decrease the pH of alkaline soils. Flooding reduces aerobic decomposition of organic matter in soils and increases anaerobic decomposition, which can result in root damaging build-up of ethanol and hydrogen sulfide.

Deposits of silt and sand can smother a tree's roots. Currents around the base of trees can wash away soil, exposing tree roots.

Flooding during the growing season is more harmful than flooding during the dormant season. Trees are most susceptible to a late spring flooding, after the first flush of growth.

The longer trees are flooded, the greater the damage. Most trees can tolerate short periods of flooding but if flooding is recurrent, the damage tends to accumulate.

The depth of water influences damage. Mortality rate for trees in saturated soils is less than for trees with water covering the soil. From soil coverage until the foliage is covered, there is little effect of increasing depth. The more the foliage is covered, the greater the damage.

Cold water is less damaging than warm water and moving water is less harmful than stagnant water because of higher oxygen content in both cold and moving water.

Trees can be damaged by mechanical abrasion from wave action of floating debris. Young plantings are especially damaged by current and

wave action. Floods may cause damage because of chemicals picked up as run-off from agriculture fields or other locations. Impact depends on type and dosage of the chemicals.

After the 1994 ice storms in Delaware, a special committee of the Urban and Community Forestry Advisory Council was established to survey storm damage and the effects on particular species. The committee generated two lists--trees that are recommended for ice storm survival and trees that received the greatest amount of damage.

Recommended Trees:

Quercus macrocarpa	Bur Oak
Carpinus caroliniana	American Beech
Taxodium distichum	Bald Cypress
Nyssa sylvatica	Black Gum
Liquidambar styraciflua	Sweet Gum
Maclura pomifera	Osage Orange
Pseudotsuga menzesii	Douglas Fir
Cedrus atlantica	Atlas Cedar
Ilex opaca	American Holly
Picea spp.	Spruce
Tsuga canadensis	Hemlock
Pinus thunbergiana	Jap. Black Pine

Most Damaged Trees:

Acer rubrum	Red Maple
Liriodendron tulipifera	Tulip Poplar
Betula populifolia	White Birch
Prunus serrulata	Ornamental Cherry
Gleditsia tricanthos v. *inermis*	Honeylocust
Betula nigra	River Birch
Quercus alba	White Oak

Portions of this article were reprinted from *VNA Newsletter*, July/August 1994.

PESTICIDE NEWS

Insecticides:

DURSBAN 50W (chlorpyrifos) - DowElanco - A wettable powder formulation of this insecticide is now available in water-soluble packets. Seven packets are included in the new, resealable plastic pouch.

EXHIBIT - Ciba Turf & Ornamental Products - This biological larvacide is now available in water-dispersible granules. The new formulation mixes with water and is ready for application after agitation.

KNOX-OUT (diazinon) - Whitmire Research Laboratories - A voluntary stop-sale and recall of PT265A Knox Out and PT 265 Knox Out 2FM has been issued after finding some of these products to be contaminated with another pesticide. The levels of contamination do not appear high enough to pose a hazard. The contamination is limited to lots formulated after early Sept. 1993. To avoid confusion, Whitmire has recalled all stock.

Fungicides:

ALIETTE (fosetyl-Al) - Rhone-Poulenc - is now labeled for use on roses (field grown, container grown and landscape) to control powdery mildew.

CONSYST (chlorothalonil/thiophanate-methyl) - Regal Chemical - is registered with EPA for use on turf, ornamental trees, shrubs and plants.

Other:

Delaware Solid Waste Authority has instituted an 18 month program for household hazardous waste collection.

New Castle County:

First Saturday of every month -
Delaware Reclamation Plant
1101 Lambson Lane, New Castle

Second Saturday of every month -
Pine Tree Corners Transfer Station
Rd 25, Townsend

Kent County:

Third Saturday of every month
Cheswold Collection Station
Rd 153, Cheswold

Sussex County:

Fourth Saturday of every month
Southern Solid Waste Management Center
Route 20, Jones Crossroads

RESEARCH BRIEFS

The Effect of Landscape Exposure on Evergreen Azaleas. Since 1974 numerous azaleas were evaluated for hardiness and adaptability to south central Kansas (zone 6). The hardiest cultivars included **Boudoir, Caroline Gable, Herbert, Karens, Pride's Pink, Purple Splendor,** and **Snowball**. Moderately hardy (probably fine for DE) were **Elsie Lee, Hollard, Girard Roberta,** and **James Gable**. Winter shade proved valuable in maintaining evergreen foliage, and good success was achieved in both Northeast and Northwest exposures. Slightly better flowering and plan condition occurred on the Northwest exposure. (J.C. Pair, L.R. Parsons and M. Daratt)

Preceding research brief excerpted from *Landscape Plant News,* Vol. 5 No. 3, October 1994.

Non-turf Groundcovers and Water Conservation. 'Challenger' Kentucky bluegrass has an optimum irrigation rate of 50 percent evapotranspiration . *Cerastium tomentosum* (snow-in-summer) required irrigation at 50-75 percent during the first year but 25 percent once established. It could provide a water-conserving alternative to 'Challenger' but unattractive seedheads and subsequent drooping occur after flowering. *Potentilla tabernaemontani* (creeping potentilla) required irrigation at 75 percent evapotranspiration to achieve good plant quality. *Sedum acre* (goldmoss stonecrop) required an irrigation rate of 25 percent evapotranspiration. It is slow-growing but should be considered as an alternative to turf in areas where water conservation is a high priority. (D. Staats and J.E. Klett)

Preceding research brief excerpted from *American Nurseryman*, October 15, 1994.

Maple Seedling Development at Various Irrigation Frequencies. The slower growth, lower shoot:root ratio, and greater specific mass of lamina of black maple as compared to sugar maple indicate this species has a greater capacity to withstand drought than sugar maple. The overall landscape value of black maple is considered equal to that of sugar maple. Growers, however, might consider the relatively slow growth rate of black maple to be a disadvantage. (W.R. Graves)

Poinsettia Fertilization with Subirrigation. In the early vegetative stage (weeks 1-4), 75 to 125 mg N/l is an acceptable range for poinsettia fertilization when subirrigation is used. Although the lower end of this range may cause some restriction in growth, it is environmentally sound because 1) the need for growth regulators is reduced and 2) 20% less N was applied at the lower rate. It is possible that moderately restricting growth in the early vegetative stage by limiting N would improve quality and reduce stem breakage of poinsettias. The optimum rate for the inductive growth stage (weeks 5-8) was 125 mg N/l. (M.A. Rose and J.W. White)

Paclobutrazol on Gymnosperms and Angiosperms. Paclobutrazol, a plant growth regulator, was less effective in reducing the growth of the gymnosperm, *Juniperus* as compared to the angiosperm, *Pyracantha*. However, paclobutrazol may have potential for increasing the stress tolerance of container-grown plants as evidenced by the increased root rating for *Juniperus*. Paclobutrazol treatments during production were still reducing shoot growth 17 months after treatment, when plants were established in the landscape. (J.M. Rutter)

Ornamental Grape Released. 'Southern Home', an interspecific hybrid grape is being released by the University of Florida as an ornamental backyard grape with adaptability to the Southern United States. This hybrid is part bunch grape and part muscadine. The leaves have deep-cut sinuses, resembling maple leaves It has potential as a home gardener's grape to be grown on arbors around patios and as borders on fences. (J.A. Mortensen, J.W. Harris, D.L. Hopkins, P.C. Anderson)

Preceding four research briefs excerpted from *HortScience,* Vol. 29(11), November 1994

Texas Blue Bonnet Cultivar Released. *Lupinus texensis* 'Barbara Bush' is a newly introduced Texas blue bonnet. It is intended for use as a bedding plant. The color is lavender.

Preceding research brief excerpted from *HortScience,* Vol. 29(10), October 1994.

Necrotic Ring Spot. The application of fertilizer (48.8 kg N/ha monthly, May-Oct.) reduced incidence of necrotic ring spot on Kentucky bluegrass. (B.P. Melvin and J.M. Vargas, Jr.)

Shipping Germinated Seed. Subatmospheric O_2 treatments (3% or less in N_2) can restrict radicle emergence of germinated seeds during subsequent shipment to a grower and the low O_2 treatment does not decrease subsequent plant growth. This would allow seed companies to ship germinated seed without injuring the radicle. Seeds could then be sown by fluid drilling or by surface seed drying and use of conventional equipment. (G.F. Polking, R.J. Gladon and D.S. Koranski)

Storage Temperatures for Bare-root Perennials. Regrowth performance was good for six tested perennials when stored bare-root for 4

or 6 months at -2, 0 and 5 C. Sufficient etiolated growth developed for most species when stored at 2C or above. Mold rating was not significantly different between -2 and 0 C. Mold increased when seeds were stored for 6 vs. 4 months. But mold growth did not reduce regrowth performance, With a few exceptions, store perennial crowns at 0 C. (M. Maqbool and A.C. Cameron.

Two Ornamental Piquin Chiles Released. *Capsicum annuum* 'NuMex Centennial' and 'NuMex Twilight' are two recently released ornamental peppers. Fruit ripens from purple to yellow then to orange and lastly to red. They are ideal for pot plant production (polychotomous branching of basal branches vs. dichotomous growth.) 'NuMex Centennial' has purple flowers and purple foliage. 'NuMex Twilight has white flowers and green leaves.

Preceding four research briefs excerpted from *HortScience,* Vol. 29(9), September 1994

Industry Trade Exhibitions. People attend trade exhibitions primarily to obtain information on new material and make potential business contact. Wholesalers are less likely than retailers to view new material and make purchases. Large firms represent 48% of all purchases. Thirty-eight percent of all buyers wanted more educational programs. (J.J. Haydu and A.W. Meerow)

Preceding research brief excerpted from *HortTechnology,* Vol. 4(2), April/June 1994

Landscaping Adds Significantly to Home Values. Real estate appraisers have guidelines that suggest the cost of some home improvements (like a fourth bedroom) are likely to be recovered in added sales price when the house is sold. others, like central air conditioning, may only recover part of its cost in higher sale price Unfortunately, there are few guidelines available to homeowners on the return in sales price that they might expect from added investments in landscaping their lots. This lack of information for homeowners may result in either under or over investment in landscaping relative to added market price from higher quality landscaping.

The market for housing is often analyzed from the hedonic perspective where the characteristics of the house and its location together influence its market price. In this study, the contribution of the quality of landscaping to the house price is estimated. Using data from a sample of 288 recent home sales in Greenville, South Carolina, a linear in the logs regression of house price on house characteristics, location and landscape quality was estimated. a house that obtained an excellent landscaping rating from a local landscaping professional could expect a sales price of about 4 to 5 percentage points higher (depending on the size of the lot) than equivalent houses with good landscaping. Homes with landscaping appeal far below (fair or poor) neighboring homes with excellent landscapes can expect a sales price 8-10% below equivalent home with good landscaping appeal. (M.S. Henry)

Preceding research brief excerpted from *J. Environ. Hort.,* Vol. 12(2), June 1994

The Effect of Plants on Mental Health. Effects of the gardening program on the mentally retarded persons were assessed on the inadaptive behavior and the social maturity for 1 to 2 years and 2 months in Seoul Welfare Center for the Mentally Retarded. The results were as follows:

1. The mentally retarded persons treated with the gardening program for 1 to 2 years and 2 months showed an improvement of the inadapative

behavior as compared with the pre-gardening program. The second (the enervation and the social isolation) and fourth (the excessive behavior and the deviant behavior) sects among the four of the Inadaptive Behavior Checklist showed an improvement in the inadaptive behavior. And first sect (crying, excitement, and anger) of the Inadaptive Behavior Checklist greatly showed improvement of the inadaptive behavior.

2. The mentally retarded persons were improved in their social maturity through the gardening program for 1 to 2 years and 2 months as compared with pre-gardening program. Both a social age and social quotient were quite a bit increased.

3. Females showed an improvement in the inadaptive behavior and the social maturity by the gardening program when compared to males, but the difference between male and female was not striking.

4. Both the higher IQ group from 55 to 70 and the lower IQ group from 40 to 54 showed improvement in the inadaptive behavior by the gardening program, but the difference between the two groups was not obvious. However, the higher IQ group through the program increased the social maturity more than the lower IQ group.

5. In both the gardening program periods for 1 to 1 year and 2 months and those for 2 years and 2 months, the inadaptive behavior and the social maturity showed an improvement when compared to pre-gardening program, but the difference between the two groups was not conspicuous. (S-H Chung and W-K Sim)

Preceding research brief excerpted from *Journal of Korean Institute of Landscape Architecture,* Vol. 20(1):69-79 (Series 45).

WELCOME NEW MEMBERS

Active Members

Mary Anne's Landscaping
6 Winward Drive
Felton, DE 19943
(302) 335-5433
Reps: Mary Anne Dill

Lawns Unlimited, Ltd.
RD 1, Box 275-1
Milton, DE 19968
(302) 645-5296
Reps: Edward Fleming, Jeanne Fleming

Reliable Gardens
P.O. Box 818
Ocean View, DE 19970
(302)537-1600
Reps: Jim Fiske

Associate Members

Bluemount Nursery
2103 Bluemount Road
Monkton, MD 21111
(410) 329-6226
Reps: Martha Pindale, Dan Simon

Hertzbach & Co.
10 Music Fair Road
Owings Mills, MD 21117
(410) 363-3200
Reps: Lawrence Aronhime, Alan Alper

Imperial Nurseries
90 Salmon Brook Dtreet
Granby, CT 06035
(203) 653-4541

Business Insights into Horticultural Distribution Centers (HDCs). The American Association of Nurserymen (AAN) announces the release of a new publication based on its landmark national horticultural distribution center survey. This publication covers the history of HDCs, current financial and operating data, and opportunities for growth. Available from AAN publications for $49 members/$89 non-members (plus shipping/handling). For more information Tel:(202)789-2900.

Selecting Trees -- A Guide to Purchasing Quality Trees as a Wise Investment. American Forests and the American Association of Nurserymen have jointly developed this publication on selecting and purchasing quality trees, designed to help inform consumers who purchase trees in quantity. The 16-page publication is available from American Forests, 1516 P Street NW, Washington DC 20005; Tel:(202)667-3300; or from the American Association of Nurserymen, 1250 I Street NW, Suite 500, Washington DC 20005; Tel:(202)789-2900. Copies cost $5.00 each plus shipping and handling. Special bulk pricing is also available.

Federal & State Quarantine Summaries. The American Association of Nurserymen has updated its "Federal & State Quarantine Summaries." This 126 page publication is available for $10 (ask for "1994 Quarantine Summary Update"). The complete update summary is available for $22.50. Contact AAN Publications, 1250 I Street, NW, Suite 500, Washington, DC 20005; Tel:(202)789-2900 or fax (202)789-1893.

Greenhouse Pesticide Safety Training. This 60-minute tape is designed to educate both greenhouse workers and handlers. The PPGA has submitted the tape to the EPA for approval for use in Worker Protection Standard training. The tape is $29.95 for members, $49.95 for non-members. Shipping/handling $5. Contact the PPGA at P.O. Box 27517, Lansing, MI 48909 or call (800)647-7742.

Water Gardens: How to Design, Install, Plant and Maintain a Home Water Garden. This publication includes a brief outline of the steps involved in constructing and planting the pool, actual physical mechanics of a pool and do's and don'ts of stocking and maintaining a water garden.. By Jacqueline Heriteau and Charles B. Thomas. Houghton Mifflin Co., New York, 1994. Hardcover $35.

December 5-6 - "Tree Hazards: The Ultimate Session," by Alex Shigo and Claus Mattheck, Sturbridge, MA. Sponsored by the Tree Care Institute and the Massachusetts Arborist Association. Contact: John Kirkland, Tree Care Educators, (503)254-0482.

December 5-8 - IPPS - Eastern Region Meeting, Adam's Mark Hotel, Philadelphia, PA.

December 5, 12 - Maintaining Tree Health. Education Department, Morris Arboretum, 9414 Meadowbrook Ave., Philadelphia, PA 19118-2697. Time: 9:00 a.m -12:00 noon. Cost: $80.00. This course prepares students for the International Society of Arboriculture's certification test. For more information Call: Education Dept. (215)247-5777 x 156.

December 6, 7 - Pesticide Applicator Training Review Session, Delaware Fire School, Dover. Day 1 - 8:30 a.m. - 4:30 p.m.; Day 2 - 8:30 a.m. - 12 noon. Recertification credit awarded. Registration required. Contact: Susan Whitney, (301)831-8886.

December 8 - Grounds Manager's Winter Seminar, Warrington Motor Lodge, Warrington. Presenting new turfgrass products, controlling woody weeds, professional ethics, and landscape plants for the Delaware Valley. Contact: Scott Guiser (215)345-3283

December 15 - Roadside/Right-of-Way Vegetation Management, Cook College Short Course, New Brunswick, $60. Tel:(908)932-9271.

December 16 - Pesticide Safety for Landscape Contractors, Cook College Short Course, New Brunswick, $115. Tel:(908)932-9271.

1995:

January 2-March 10 - Golf Turf Management School, Cook College Short Courses. Tel:(908)932-9271.

January 2-13 - Professional Turf & Landscape Management, Cook College Short Course, $115. Tel:(908)932-9271.

January 3-6 - "Advanced Turfgrass IPM Short Course," sponsored by the University of Maryland Cooperative

Extension Service. Contact: Extension Secretary, Department of Entomology, University of Maryland, College Park, MD 20742. Tel:(301) 405-3913.

January 4-6 - Winter MANTS. Baltimore Convention Center, MD. Contact Carville Akehurst (410)256-1799, FAX: 410-256-2208.

January 5 - Pest Management of Landscape Turf, Cook College Short Course, New Brunswick, $115. Tel:(908)932-9271.

January 9-13 - "Advanced Landscape Plant IPM Short Course," sponsored by the University of Maryland Cooperative Extension Service. Contact: Extension Secretary, Department of Entomology, University of Maryland, College Park, MD 20742. Tel:(301)405-3913.

January 10-12 - Eastern Pennsylvania Turfgrass Conference and Trade Show, Valley Forge Convention Center. Pre-registration is encouraged. Contact: Scott Guiser (215)345-3283, Chris King (814)863-3475.

January 10-12 - Golf Course Turfgrass Management, Cook College Short Course, New Brunswick. Tel:(908)932-9271.

January 12 - Pest Management of Ornamental Landscape Plants, Cook College Short Course, New Brunswick, $115. Tel:(908)932-9271.

January 17, 24 - Garden Center Management, Ornamental Horticulture Short Course Program, Fischer Greenhouse Classroom, Newark. 3-5 PM. Tel:(302)831-2531.

January 17-19, 24-26 - IPM basics short course. This is the course given by the Rutgers Cooperative Extension Landscape IPM Program and from which the cooperators who participate with us are chosen. Cook College short Course, New Brunswick. Tel:(908)932-9271.

January 18-19 - Delaware Horticulture Industry Expo, Sheraton Inn, Dover, DE. Contact Linda Pevey (302)629-0329.

January 19 - Eastern Regional Winter Nursery Seminar, Delaware Valley College. One day conference-topics include: new and under used plants, fall and winter color and marketing perennials. Contact: Dave Suchanic (610)489-4315.

January 21-22 - Pesticide Applicator Training Review Session, Delaware Fire School, Dover. Day 1 - 8:30 a.m. - 4:30 p.m.; Day 2 - 8:30 a.m. - 12 noon. Recertification credit awarded. Registration required. Contact Susan Whitney (302)831-8886, for further information.

January 22 - Pesticide Applicator Certification Exam, Delaware Fire School, Dover, 1:00 p.m. contact Larry Towle, 1-800-282-8685.

January 23-24 - Greenhouse Systems Short Course, Cook College. Tel(908)932-9271.

January 23-26 - Professional Horticulture Conference of Virginia, LTD. and Trade Show, Virginia Beach Pavilion & The Radisson Hotel. For more information contact Polly Carden: (804)853-0057 or (804)523-4734; Fax: 804-523-4734.

January 25, Feb. 1,8,15 - Estimating Landscape Proposals, Cook College Short Course, New Brunswick. Tel:(908)932-9271.

January 30 - 5th Annual University of Delaware Pesticide Conference, Sheraton Inn, Dover, DE. Contact Susan Whitney (302)831-8886 for further information.

February 2-5 - WNGA/NLA/GCA Management Clinic, Louisville, KY. Contact: AAN (202)789-2900.

February 6, 7 - 30th Annual Shade Tree Symposium and Trade Show, Lancaster Host Resort and Conference Center, Lancaster, PA. Hosted by Penn-Del Chapter, International Society of Arboriculture and Penn State Extension. Contact Elizabeth Wertz at (215)795-2096.

February 8 - Grounds Maintenance Seminar, Kutztown Grange Hall, Kutztown. Contact: Judith S. Schwank (610)378-1327.

February 8, 15 - Basics of Plant Growth & Soils, Ornamental Horticulture Short Course Program, Fischer Greenhouse Classroom, Newark. 3-5 PM. Tel:(302)831-2531.

February 9 - Northeastern PA Turfgrass and Grounds Maintenance School, Mountain Laurel Resort, White Haven. Contact: Chris King (814)863-3475 or Andrew McNitt (814)863-1368.

February 14, 16 - Weed Control in the Nursery and Landscape, Ornamental Horticulture Short Course Program, Kent County Extension Office, Dover. 3-5 PM. Tel:(302)831-2531.

February 14-16 - Pennsylvania Nursery Conference, Hershey Convention Center. Contact: Dr. Larry Kuhns

PSU (814)863-2189 or Corrine Shearer PNA (717)238-1673.

March 8 & 15 - Estimating for Residential Landscape Installation Workshop, Penn State Great Valley, Malvern - Time: 9:00 a.m.-4:00 p.m. Contact: Russ Powell (215)345-3283 or Rick Johnson (610)565-9070.

March 13-14 - Christmas Tree Pest Control Short Course, Days Inn, State College. Contact: Christmas Tree Short Course (814)865-8301.

April 4, 6, 11, 13 - Diagnosis & Control of Insects on Woody Ornamental Plants, Ornamental Horticulture Short Course Program, Fischer Greenhouse Classroom, Newark. 3-5 PM. Tel:(302)831-2531.

April 26 - Mid-Atlantic Interior Landscape Conference, Longwood Gardens, Kennett Square, PA. For more information contact: Penn State Cooperative Extension, Montgomery County. Tel:610)489-4315, FAX:(610)489-9277.

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

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

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

July 27-30 - AAN Convention, Twin Cities, MN. Tel:(202)789-2900.

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