



# Bulletin

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## Successful Propagation of Vegetative Annuals 2

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through sticking the cutting. This month, the article concludes with a detailed look at optimizing the propagation environment, which is summarized in Table 1 (page 8). Check out the web site [http://www.ces.ncse.edu/depts/hort/floriculture/crop/crop\\_prop.htm](http://www.ces.ncse.edu/depts/hort/floriculture/crop/crop_prop.htm) for more propagation photos to augment this article.

### THE PROPAGATION ENVIRONMENT

A good principle to remember for successful propagation of cuttings is that the propagator strives to maintain “warm bottoms,” “misty middles,” and “cool tops.”

**Water and mist.** Minimizing moisture stress is at the heart of rooting cuttings. During propagation, the grower is fighting the loss of water from the cutting via transpiration until roots are developed adequately to begin absorbing it from the rooting medium. Rooting cuttings under intermittent mist or fog helps minimize transpiration by keeping relative humidity high, and it generally keeps the surface of the substrate moist. However,

depending upon the rooting medium and mist application rate, do not overlook the potential need to occasionally water the cuttings overhead to maintain a uniformly moist substrate. Take note of where air currents from HAF fans or convection tubes blow down on the mist table, and watch bench perimeters for more frequent irrigation needs. Monitoring root growth and development over time and observing the ability of the

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### PART II

Last month, Part I of this article addressed the characteristics of a high-quality unrooted cutting and preparations for propagation

## PROMOTING INDEPENDENT GARDEN CENTERS

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The Cincinnati Flower Growers Association consists of 90 members – active, associate, educators, suppliers, and wholesale florists. Of this number, approximately 32 have retail garden center locations. The growers meet 10 months out of the year, visiting a member’s growing facility, garden center, or florist operation. The meetings are always well attended, and the sharing among the growers is almost legendary. (We’ve been told that the Cincinnati Flower Growers are unique to this effort – sharing information openly and honestly.) However, sharing is now more about promotion as independents, rather than as wholesale florists, even though everyone is still growing most of their own plant material. The talk now seems to be geared more around the latest event, not so much the crop itself.

Over the years, with the dawning of the age of the garden center, the focus changed from growing to retailing. The make-up

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To support and promote floriculture professionals through lifelong learning, career enhancement, and public awareness.



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**AMERICA IN BLOOM ANNOUNCES WINNING CITIES**



Winners of the 2002 edition of America in Bloom (AIB) were recently announced at the inaugural awards ceremony in Washington, D.C. Mayors, elected officials, municipal employees, national founding stewards, and citizen volunteers from 38 communities were among the attendees.

Winners were awarded in each of six population categories. The winners were Chicago, Illinois; Kalamazoo County, Michigan; Fayetteville, Arkansas; Westlake, Ohio; Fairhope, Alabama; and Camp Hill, Pennsylvania.

The AIB organization is dedicated to promoting nationwide beautification programs and both personal and community involvement through the use of flowers, plants, trees, and other environmental and lifestyle enhancements, and to providing educational programs and resources.

Efforts in the America in Bloom program are recognized and awarded by qualified judges for community involvement, heritage preservation, environmental awareness, tidiness, floral displays, turf and groundcover areas, landscapes, and urban forestry. The program encourages volunteerism and involves municipal governments, businesses, organizations, and citizens in improving their community's quality of life.

Many communities already have programs, activities, and services that fit the AIB spirit, but just need a little extra effort to package them together and create more awareness. The AIB program brings all community efforts that improve the quality of life under an "umbrella" that creates a sense of unity. The contest is a forum of expression and a rallying point. All participants win by working together to beautify and improve their communities.

**HOW DO I GET INVOLVED?**

If you want to get your community involved, the first step is to approach your local government officials. In most cases, this is the mayor or the city or village council. Once you get support from your community leaders, the next step is to organize a committee to coordinate participation and collective efforts. This could be an existing beautification committee or a newly created America in Bloom committee. Its mission is to organize a local beautification campaign and act as a liaison with local officials for projects involving public sites.

This committee is usually made up of local citizens, including one member of the municipal government or council and members of associations, businesses, and other organizations interested in community life.

To learn more about the America in Bloom program or to register for the 2003 edition, please contact the AIB office at 614-487-1117 or e-mail Lkunkle@ofa.org. The deadline to register is March 31, 2003.

## 2002 AMERICA IN BLOOM PARTICIPANTS

**Under 10,000 population**

Amelia, Ohio  
 Belleville, Michigan  
 Burton, Ohio  
 Camp Hill, Pennsylvania\*  
 Lapeer, Michigan  
 Lavonia, Georgia  
 Lewes, Delaware  
 Lynden, Washington  
 Middlefield, Ohio  
 Silverton, Ohio  
 Waterloo, New York

**10,000-25,000**

Batavia, Illinois

Bay Village, Ohio  
 Fairhope, Alabama\*  
 River Edge, New Jersey  
 University of Massachusetts,  
 Amherst  
 Willoughby, Ohio  
 Winchester, Massachusetts

**25,000-50,000**

Annapolis, Maryland  
 Barberton, Ohio  
 Glen Ellyn, Illinois  
 Sandusky, Ohio  
 Westlake, Ohio\*  
 Wheat Ridge, Colorado

**50,000-100,000**

Fayetteville, Arkansas\*  
 Lee's Summit, Missouri  
 Stratford, Connecticut

**100,000-300,000**

Akron, Ohio  
 Des Moines, Iowa  
 Kalamazoo County, Michigan\*  
 Modesto, California

**Over 500,000**

Chicago, Illinois\*  
 Mecklenburg County,  
 North Carolina  
 Monroe County, New York



**America in Bloom/  
 Communities in Bloom  
 Twinning (non-compete  
 mentoring category)**

Bay City, Michigan  
 Goderich, Ontario  
 Qualicum Beach,  
 British Columbia  
 Sequim, Washington

(\*DENOTES WINNING CITY)

# DISEASES OF PERENNIALS

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This article will describe the most common diseases of herbaceous perennials. It will also address some of the ways to control or manage these diseases. Though it presents some unique challenges, disease control in perennials is very similar to disease control in herbaceous annuals. Number one is knowing what diseases are important and how to identify them.

Before you plant anything, make certain the material that you are planting (seed, corm, rhizome, cutting, etc.) is free from diseases and insect pests. Purchasing propagation material from a reputable producer will help ensure high quality starting material.

**CORM, RHIZOME, AND BULB ROT**

**Rots:** Any time you place a fleshy structure such as a corm, bulb, or rhizome in the soil, it can be subject to rot by a variety of pathogens. Common soil fungi, such as *Fusarium* sp. and bacteria, such as *Erwinia* sp. are very effective rot organisms if given the opportunity (Figure 1, page 4). Planting propagation material that has wounds (insects or mechanical) or has freeze damage will allow these destructive organisms to enter and initiate rot. Careful attention must be paid to the condition of the propagation material prior to planting.

**Common hosts for corm and bulb rots:** Any perennial that is propagated by means of a corm, bulb, or rhizome is subject to rot.

**ROOT DISEASES**

**Pythium or Phytophthora Root Rot:** These are the most common root diseases of perennials. These diseases are caused by the fungi *Pythium* sp. or *Phytophthora* sp. They are most often seen in roots of plants growing in soil or media that is not well drained, where the roots of the plants have been subjected to water-saturated conditions for an extended period of time. Symptoms include wilting and overall yellowing of the plant (Figures 2A & B, page 4). Roots of affected plants will appear brown and mushy.

Disease management strategies include planting in media that is well drained and not allowing plant roots to sit in water too long. In conditions of high Pythium or Phytophthora, potential chemical treatments can be very effective.

**Common hosts for Pythium and Phytophthora Root Rot:** Most perennials are susceptible to Pythium and Phytophthora root rot.

**CROWN AND STEM DISEASES**

**Rhizoctonia Crown and Root Rot:** Though *Rhizoctonia solani* can cause a root rot, it is more important as a crown-rotting organism in perennials. The fungus is very common in most soils. It attacks plants at the soil level and rots them off at the crown. The fungus grows up the stem and forms a stem rot or canker (dark sunken area). Symptoms are plant wilt and overall lack of vigor. Once wilting is seen, the damage cannot be corrected.

Controls for *Rhizoctonia* consist of growing plants in media that is well drained, growing plants in synthetic media that has NOT been supplemented with native soils, not allowing media temperatures to be too cool, and using chemical fungicides.

**Common hosts for Rhizoctonia Stem Rot:** Most perennials are susceptible to *Rhizoctonia* sp. if grown in a favorable environment for disease development.

**Cottony Stem Rot:** This is one of the most destructive diseases associated with herbaceous perennials. The disease is caused by the fungus *Sclerotinia sclerotiorum*, a soilborne fungus that produces a resistant resting structure that can remain dormant in the soil for years. Under improper environmental conditions, and in the presence of a susceptible host, the fungus can become active. The fungus attacks at the base or crown of the plant and moves rapidly up the stem. The fungal growth is very fluffy and white (Figure 3, page 4). In the latter stages of disease development, the fungus produces hard, black resistant structures (sclerotia) (Figure 4, page 4).

Plants affected with Cottony Stem Rot should be destroyed. Susceptible plants should not be planted in soil infested with *Sclerotinia*. Chemical controls can be used as a soil or media drench, but these chemicals will not inactivate the sclerotia.

**Common hosts for Cottony Stem Rot:** Some of the most

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## DISEASES OF PERENNIALS

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common perennials susceptible to cottony stem rot disease are ajuga, artemisia, aster, bleeding heart, columbine, coral bells, shasta daisy, delphinium, dianthus, hyacinth, iris, liatris, lily, lupine, phlox, poppy, primrose, salvia, statice, tulip, and violet.

**Southern Blight:** Like Cottony Stem Rot, this disease has the potential to be very destructive. Many of the host plants affected by Cottony Stem Rot are also affected by Southern Blight. Southern Blight is caused by the fungus *Sclerotium rolfsii* and it can be identified by the obvious growth of white fungal mycelium at the base of the stem, although the growth tends

not to be fluffy. The Southern Blight organism also produces resistant structures (sclerotia), but unlike Cottony Stem Rot, the sclerotia are spherical, brown, and about the size of a mustard seed (Figure 5).

The disease is seen in periods of high temperature, (80 to 90°F) and high soil moisture. The fungus attacks the host at the soil level and moves up the stem, rapidly decaying the tissue as it moves. Affected plants wilt and in the latter stages collapse. Dozens of mustard seed-size sclerotia will be seen covering the affected plant stem (Figure 5).

Control strategies for this disease are very similar to those outlined for Cottony Stem Rot.

**Common hosts for Southern Blight:** The host list for Southern Blight is very similar to that of Cottony Stem Rot.



Figure 1. Bacterial Bulb Rot of iris.

### VASCULAR WILTS

Vascular wilt diseases occur when selected species of fungi infect the vascular tissue (xylem and phloem) of the plant. The infecting pathogen produces enzymes and toxins that break down the vascular tissue. In most cases, vascular wilts are caused by two genera of fungi, *Verticillium* sp. and *Fusarium* sp. Vascular wilts usually occur in more mature plants.

**Verticillium Wilt:** This disease is one of the most common of the vascular wilts in perennials. It is caused by two species of the *Verticillium* fungus, *V. albo-atrum* and *V. dahliae*.

The most common and the most obvious symptom associated with plants infected with *Verticillium* sp. is wilt. Wilted plants may "recover" from the wilt in the evening or in times of abundant moisture. In some cases, only one side of the

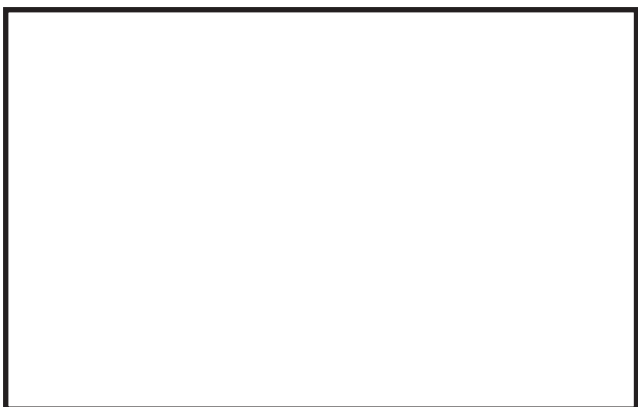


Figure 2. A) *Pythium* Root Rot of columbine. Note: stunted, off-color plant and B) rotted roots of perennial plug. Note: off-colored plant.



Figure 3. White fluffy growth of *Sclerotinia* Cottony Rot on the base of an infected cone flower.



Figure 4. Sclerotia of Cottony Stem Rot inside the pith of cone flower.

affected plant will wilt. Plants infected with *Verticillium* sp. will show dark or discolored vascular tissue when cut open. This is a key diagnostic symptom associated with most vascular wilt diseases.

The best way to control *Verticillium* Wilt is to not introduce it into your operation, and be sure that the cuttings that you purchase or produce are wilt-free. Also, try not to mix native soil in with your mix. Chemical treatments are not very effective once the disease becomes established.

**Common hosts for *Verticillium* Wilt:** Aster, chrysanthemum, coreopsis, delphinium, peony, poppy, and phlox.

***Fusarium* Wilt:** *Fusarium* Wilt is caused by the fungus *Fusarium oxysporium*. Like *Verticillium*, this fungus is very

common in most soils. However, the perennial hosts that it infects are less in number than that of *Verticillium*. Symptoms associated with *Fusarium* Wilt are similar to those of *Verticillium* Wilt. The methods of control are also the same.

**Common hosts for *Fusarium* Wilt:** China aster, chrysanthemum, and dianthus.

### FOLIAR DISEASES

Foliar diseases are the most common diseases associated with herbaceous perennials. In most cases these diseases are caused by fungi; however, bacteria can incite some significant foliar diseases. We will cover the most common of the foliar diseases of perennials.

**Powdery Mildew:** This is a common foliar disease of perennials. It is also one of the easiest to identify. This disease rarely kills the host outright. However, severe infection can cause the host to defoliate prematurely. Also, the cosmetic damage caused makes some plants unsaleable or aesthetically unacceptable. The most prominent symptom associated with Powdery Mildew infection is the presence of white fungal growth on the leaves, flowers, or stems of the affected plant. Under conditions of extreme infection, the whole plant appears to be dusted with snow.

The most effective way to control or manage Powdery Mildew is to grow plants that are resistant to the disease and to modify the environment in an effort to inhibit disease development. Do not allow leaves to remain wet for extended periods of time. Chemicals can be used to control Powdery Mildew if used early and with the proper application.

**Common hosts for Powdery Mildew:** Many different perennials are susceptible to Powdery Mildew. Phlox, aster, dahlia,



Figure 5. Southern Blight of penstemon. Note: many small brown sclerotia.



Figure 6. Aster Rust is commonly seen as a late-season problem.



Figure 7. Bacterial Leaf Spot of geranium.

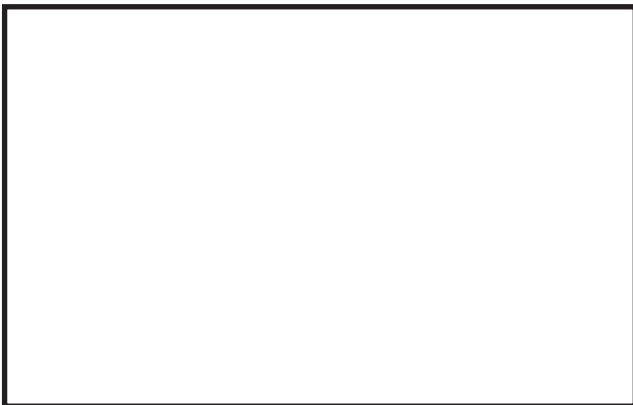


Figure 8. A) Virus-induced ringspot in hosta and B) Cucumber Mosaic Virus-induced deformation of delphinium.

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## DISEASES OF PERENNIALS

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delphinium, rudbeckia, lupine, dianthus, yarrow, columbine, chrysanthemum, and coreopsis are some of the most common.

**Rust:** Leaf and Stem Rust of perennials is caused by a group of fungi that produce masses of rust-colored spores as part of their life cycle. In most cases the spore masses are more prevalent on the underside of the leaf surface, but not always. Like Powdery Mildew, Rust very rarely kills the plant outright. With some hosts, Rust can be very devastating, so it's not a disease that can be ignored. The disease is relatively easy to diagnose, because the spore masses are very abundant and obvious (Figure 6, page 5).

To control Rust, careful attention must be paid to the environmental conditions in which the plants are grown. Keeping the relative humidity down and not allowing free moisture to stand on the leaf surface for extended periods will help discourage disease development. There are a few good fungicides labeled for the control of Rust.

**Common hosts for Rust:** Aster, daylily, dianthus, chrysanthemum, hollyhock, pansy, phlox, and iris.

**Botrytis Blight:** This one of the most common diseases of the perennials, both in the production facility and in the landscape. The disease is caused by the fungus *Botrytis* sp. and is some times referred to as Gray Mold. This fungus has a very wide host range. Disease severity can range from minimal to plant death. Initial stages of the disease show up as small irregular brown spots on the leaves, flower petals, flower buds, or stems. Under humid conditions the spots may spread rapidly, and the infected tissue may look soft and may be covered by the gray fluffy growth of the fungus. The disease is most prevalent during times of cool wet weather in the early spring to early summer. If left unchecked, small plants can rot and more established plants can succumb to leaf blight or stem canker.

The best way to control Botrytis Blight is to grow plants in

an environment that is not conducive for the disease. Low relative humidity and plenty of air movement around and across the plants goes a long way toward keeping disease to a minimum.

**Common hosts of Botrytis Blight.** Just about every type of herbaceous perennial is susceptible to Botrytis Blight.

**Bacterial spots and others.** There are many other pathogens that can initiate foliar disease. Bacteria and other leaf-spotting fungi such as *Alternaria* can be a real problem, particularly when there is abundant leaf moisture (Figure 7, page 5). Care should be taken to make the growing environment unfavorable for these pathogens. Low relative humidity and abundant air movement are keys to their elimination.

## VIRUSES

Diseases of herbaceous perennials caused by plant viruses are not as common as diseases caused by fungi. However, they can be just as significant depending on the virus and the host. There are many different viruses that infect perennials and most of them induce symptoms that are similar. Cucumber Mosaic Virus is probably the most common virus found in perennials but not necessarily the most destructive. Viruses such as Impatiens Necrotic Spot Virus and Tomato Spotted Wilt Virus can cause severe damage to the plants they infect. Symptoms associated with virus infection include, but are limited to, plant stunting, yellowing of entire plant, ring-like spots on the leaves, deformed leaves, blackening of stems, plant distortion, and leaf mosaic (Figures 8A&B, page 5).

There are no chemicals that can be applied to plants to "cure" them of virus infection. Once a plant is infected, it will remain infected for life. Even if plants die-back to the ground, the roots and crown are still infected, and when the new growth appears in the spring, it will be infected. Most plant viruses are moved about by insects, primarily aphids, thrips, and whiteflies. Insect control is essential for keeping viruses to a minimum, both in production and in the landscape. Plants infected with virus should be removed and destroyed. And never propagate from virus-infected plants.

OFA

## SUCCESSFUL PROPAGATION OF VEGETATIVE ANNUALS

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cutting to remain turgid with less and less mist helps the propagator regulate the amount of moisture applied to the plant. If the cuttings are continually rooting under saturated conditions, root growth and development will be slowed because of oxygen depletion in the substrate.

During the early stages of propagation, a fairly constant film of moisture on the foliage is usually appropriate for most species. The mist regime may be three to eight seconds every 5 to 10 minutes. Cuttings of some species should be misted

during nighttime hours for the first two to three days in order to rehydrate, with a recommended mist regime of five seconds every 15 to 20 minutes. Once cuttings have callused, reduce the mist as much as possible without letting them wilt. Water management is the best tool for controlling growth, especially after roots are visible and new shoot growth is observed. Avoid excessive ventilation early in the propagation cycle, as this can dehydrate the cuttings. Once they have begun rooting, air circulation will help

tone them and get them acclimated to harsher finishing conditions.

**Wetting agents as foliar sprays.** Cuttings can be sprayed with wetting agents immediately after sticking, with the objective of reducing transpiration by prolonging leaf wetness or turgidity. Surfactants such as AquaGro® (2 to 3 ounces per 100 gallons) or Capsil® (4 fluid ounces per 100 gallons) are used. Before applying a wetting agent to the entire propagation plot, spray a small section and experiment with the rate you have chosen.

**Temperature control and bottom heat.** As with production, it is the temperature of the root medium, and not

the air temperature, that is critical to optimize the rooting process. Thus, providing bottom heat is ideal in a propagation setting. Generally speaking, vegetative annuals will propagate best at higher temperatures than they will be grown. The optimum temperature of the root medium varies among species, but it is generally 72 to 75°F; 68°F is at the lowest end of the range, and the low 80°F area is at the high end of the range. If the temperature is too low or too high, potential problems include delay or prevention of rooting, diminished uniformity of rooting, and increased incidence of disease problems. At low temperatures, plant metabolism

is slowed and callus/root formation is delayed. Once roots emerge from the bottom of the tray, bottom heat should be reduced to as low as 60°F to minimize unnecessary stretch. Bottom heat can be supplied in many ways, including propagation mats with electrically-heated wires encased in rubber, heating tubes on benches which carry warm water, and steam pipes under benches. The air temperature does also affect rooting rate and should generally be maintained between 65 to 75°F.

**Light.** Because the propagation process focuses on the initialization and development of roots, high light levels to drive photosynthesis are generally not needed. Therefore, use of supplemental light in propagation areas is rare, although it is used for winter propagation by some Northern growers. Instead, shade is often used in the propagation area to manage water loss – to prevent cuttings from dehydrating and wilting rapidly. Excessive light increases leaf temperatures and increases the transpiration rate. However, light levels that are too low can slow rooting or result in weak growth, especially after roots are established. Light levels should generally be less than 2,000 footcandles ( $400 \text{ umol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$ ) before significant root growth occurs, and lower levels of 1,000 footcandles ( $200 \text{ umol}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$ ) are preferred for the first several days after sticking cuttings. Though it is difficult to implement, light intensity would ideally be increased slowly as callus, and then roots, form on cuttings (Table 1, page 8).

**Fertilization.** Fertilizing through overhead mist emitters is normally not recommended for vegetative annuals unless the cuttings are on the propagation bench for an extended period of time (greater than four weeks). It

may also cause problems with clogging mist emitters if salts form in the water line. Therefore, cuttings should be fertigated through a hose. In general, the first application of a soluble fertilizer can occur at signs of a visible callus using rates of N ranging from 50 to 75 ppm. Normally this occurs around 5 to 10 days after sticking cuttings. Once the root initials protrude from the cutting base, cuttings can be lightly fertilized with 100 ppm N from a complete fertilizer. The cuttings should never be fertilized when the substrate is the least bit dry.

A low phosphorus (P) and ammoniacal-N ( $\text{NH}_4\text{-N}$ ) fertilizer should be used during propagation. High levels of P have been shown to increase stem elongation, promote flowering, and are toxic to some of the native Australian species such as scaevola and argyranthemum, while  $\text{NH}_4\text{-N}$  causes lush cutting growth. Use fertilizers like 13-2-13 and 15-5-15 in the propagation area weekly at concentrations of 50 to 100 ppm N. Acidic fertilizers like 20-10-20 should be used if growers have moderate levels of alkalinity in their irrigation water. To control the high P/  $\text{NH}_4\text{-N}$  of 20-10-20, a low rate can be applied to provide micronutrients, and growers can rotate the feedings with a dark weather formula or calcium nitrate [ $\text{Ca}(\text{NO}_3)_2$ ].

**Plant growth regulators.** Plant growth regulators (PGRs) can be used in the propagation area to prevent undesirable stretch, but they should be used cautiously and selected carefully. In general, the more forgiving PGRs like daminozide (B-Nine<sup>®</sup>) and chlormequat-chloride (Cycocel<sup>®</sup>) are used as single treatments or in combination as a tank mix during the later phases of the propagation cycle. Rates of foliar sprays for



daminozide range from 1,000 to 2,500 ppm, while chlormequat is normally applied at rates between 750 and 1,500 ppm. Drench applications to trays of rooted cuttings through subirrigation have shown promise with some vegetatively-propagated species.

Ethephon (Florel<sup>®</sup>) is the most popular PGR in the propagation industry today because of its desired effects on vegetative annuals: an increase in lateral branching, flower inhibition, and a reduction in internode elongation. While ethephon can be applied to stock plants and transplants in the final container, it can also be sprayed on cuttings in the propagation phase between the time that misting is significantly reduced and the hardening-off stage. Before applying ethephon, be sure that cuttings have a functional root system and shoots are not under any environmental stress. Rates of application range from 150 to 500 ppm, depending on the plant species.

**Hardening off.** This is referred to as Stage 4 of the propagation phase. Cuttings should be hardened off after roots reach the bottom of the rooting tray prior to transplanting. Cuttings coming off of the mist bench can sometimes be nutrient-deprived. Some common causes of symptoms of foliar chlorosis during this phase include N, magnesium (Mg), and iron (Fe) deficiency. The symptoms can be counteracted with a biweekly application of an N fertilizer, epsom salts drench (8 ounces per 100 gallons), or foliar sprays of chelated iron (4 ounces per 100 gallons),

respectively. It is important to fertilize during hardening off because nutrient treatment during this stage affects the growth and development of the plant once transplanted to its final container. An application of a preventative fungicide drench of Subdue Maxx<sup>®</sup> (0.5 ounces per 100 gallons) or Banrot<sup>®</sup> (6 ounces per 100 gallons) protects against root rots. An application of Marathon<sup>®</sup> II (1.7 fluid ounces per 100 gallons) is suggested in the holding house if whitefly or aphids are observed and a granular application has not previously been made. An application of AquaGro<sup>®</sup> (1 ounce per gallon if using a 1:100 injector) to the medium may aid in the retention of moisture for cuttings with well-developed root systems. This treatment is especially helpful when transplanting is delayed. Leaving a 2-inch gap between the rooting trays during the hardening-off phase is helpful to increase airflow and avoid stretching of the cuttings.

**Pest management.** Cuttings are susceptible to several devastating diseases in the propagation area, including Botrytis, which is a very common problem. Sanitation is the best strategy against diseases during propagation. Botrytis, for example, can often be controlled by the daily removal of senescing foliage and other plant debris. However, foliar sprays of fungicides can be applied 7 to 10 days after sticking cuttings if needed, and products currently available include iprodione (Chipco 26019<sup>®</sup>), thiophanate methyl (Clearys 3336<sup>®</sup>), trifloxystrobin (Compass<sup>®</sup>),

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## SUCCESSFUL PROPAGATION OF VEGETATIVE ANNUALS

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chlorothalonil (Daconil®), fenhexamid (Decree®), and azoxystrobin (Heritage®).

Two of the most common insect pests in propagation areas are fungus gnats and shore flies. The larval stages of both species can transmit diseases like Pythium and black root rot. Fungus gnat larvae are most damaging to newly emerging roots from cuttings and can invade their vascular structure, resulting in wilt. Shore flies can become a nuisance to propagators by depositing excrement on the cutting

foliage, which is a cosmetic issue. A monitoring technique for fungus gnat larvae populations is the insertion of raw potato sticks into the propagation media and removal after 48 hours for counts. Products that are available for fungus gnat control include the insect growth regulators diflubenzuron (Adept®), pyriproxyfen (Distance®), and the microbe *Bacillus thuringiensis israelensis* (Gnatrol®).

### Keeping good records.

Record keeping is very important in propagation –

it serves as a tracking mechanism for propagators in the present and a source of information for the future. Information that should be kept includes: where cuttings were stuck; source of the cutting material; cutting size and number; rooting hormone and concentration used; root zone and air temperatures; employees that stuck the cuttings; dates of callus, visible root initials, and rooting; and date removed from mist.

### Show me the money.

Exploring opportunities to produce vegetative annuals may make sense for growers who want to capitalize on the explosion of interest in this market segment.

Production of these plants from unrooted cuttings may require a new commitment to propagation that could become a lucrative component of your spring sales program.

*Recommendations for the use of products are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by North Carolina State University, Kansas State University, or OFA, nor discrimination against similar products or services not mentioned.*

**Table 1.** Propagation stages (1 through 4) and the appropriate action steps to achieve successful propagation.

	Stage 1	Stage 2	Stage 3	Stage 4
<b>Description</b>	Sticking cutting to swollen base (root initiation)	Callus development to visible root initials	Visible roots to significant shoot and root growth	Toning stage prior to transplant
<b>Light</b>	500 to 1,500 footcandles	1,300 to 1,800 footcandles	1,500 to 2,300 footcandles	2,000 to 4,000 footcandles, depending on crop
<b>Root Zone Temperature</b>	68 to 80°F	68 to 73°F	65 to 68°F	60 to 65°F
<b>Air Temperature (night)</b>	70 to 80°F	68 to 73°F	65 to 68°F	58 to 65°F
<b>Mist</b>	Mist every 5 to 10 minutes for 3 to 8 seconds for 24 hours, reduce to every 10 minutes after 3 to 4 days	Mist every 10 to 20 minutes, for 3 to 5 seconds, every 20 to 50 minutes closer to Stage 3	Discontinue mist, syringe as needed	Begin overhead or subirrigation
<b>Media Water Status</b>	Keep media moist	Maintain moderate level of moisture in tray	Reduce media moisture	Allow media to dry
<b>Rooting Hormones/ PGRs</b>	Spray or quick dip cuttings of some species with rooting hormone	Do not apply PGRs, wait for adequate root development	B-Nine® foliar spray – 1,000 to 2,500 ppm; Cycocel® foliar spray – 750 to 1,500 ppm; Florel® – 150 to 500 ppm	B-Nine® foliar spray – 1,000 to 2,500 ppm; Cycocel® foliar spray – 750 to 1,500 ppm; Florel® – 150 to 500 ppm
<b>Fertilization</b>	Do not apply fertilizer	Apply a weekly 50 to 75 ppm N, low P/NH <sub>4</sub> -N fertilizer	Apply a weekly 50 to 100 ppm N, low P/NH <sub>4</sub> -N fertilizer	Apply a weekly 125 to 250 ppm N, low P/NH <sub>4</sub> -H fertilizer; tone with epsom salts, iron chelate

# OVERWINTERING CONTAINER-GROWN PERENNIALS USING RETRACTABLE ROOF GREENHOUSE STRUCTURES

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Overwintering container-grown perennials has been a real challenge at Riverbend Nursery for the past 18 years. The nursery is located in southwestern Virginia, nestled in the Blue Ridge Mountains at an elevation of 2,250 feet above sea level, or USDA Zone 6B (Figure 1). Because of this elevation, we can have extreme cold and heat all within a 24-hour period. In addition, we have an elevation difference of 175 feet from one end of the nursery to the other. This not only provides good drainage, but many microclimates as well.

Riverbend grows approximately 3.7 million containers yearly, with a total of 2,000 varieties. The dominant sizes for perennials are quart, gallon, and 2-gallon containers. Groundcovers are grown in 2.5-inch and 4-inch pots as well. Our market includes independent garden centers, landscapers, and re-



Figure 1. An overview of Riverbend Nursery Inc.



Figure 2. A close-up of some of the retractable roof greenhouses at Riverbend Nursery.

wholesalers servicing the nine mid-Atlantic states. We do not sell to chain stores.

Our standard production cycle involves potting most products from late summer to early fall, allowing plants to develop a solid root system prior to going dormant. Top growth is not the focus at this time, because most plants are intended to be sold in the spring as they break naturally, and not through forcing.

We started off with unheated 16-foot wide Quonset houses many years ago. We gradually added 30-foot wide Quonset houses with roll-up sidewalls about seven years ago. It was our quest to moderate the temperature fluctuation that led us to try the larger, higher peaked houses with roll-up sidewalls. These have worked well over the years, but we were still looking for a solution that gave us greater control, especially for our quart perennial lines. We found that high spring temperature spikes caused the perennials to bolt up with the first burst of spring. Because our nights would then get cold, we suffered burn from the dropping temperatures. Five years ago, I began looking for a better solution.

I made numerous trips to various parts of the country looking for a solution to my problem. Three years ago, we constructed our first retractable A-frame roof greenhouse by Cravo (Figures 2 & 3). There were a few companies offering this type of structure, but Cravo seemed to be the leader in this field, backed by years of research. I attended seminars on the advantages of this type of structure prior to purchasing. The investment of a retractable roof house over a typical Quonset was substantially more, and I wanted to make sure it was worth the difference.

I am going to share my firsthand experience and that of some other growers I talked to, describing both advantages and disadvantages to this type of structure. Having grown in a structure of this type for just two years, we are still learning how to get the desired results that others are already achieving.

## ADVANTAGES OF RETRACTABLE ROOF GREENHOUSES VS. TRADITIONAL QUONSETS

1. Allows planting later into the fall, because the roof can be closed early in the day, trapping heat and promoting root



Figure 3. Inside a greenhouse at Riverbend Nursery Inc.

*Continued on page 10*

## OVERWINTERING CONTAINER-GROWN PERENNIALS

*Continued from page 9*

growth. We have already found that it provides us an additional four to five weeks more growing time in the fall – without the use of heat.

2. Allows growers to open the roof on clear sunny days during the winter. This provides for maximum air circulation, especially since numerous perennial varieties retain much of their foliage through the winter. The net result is healthier plants and a reduction in pesticide usage during the winter months.

3. Allows growers to open/close the roof during periods of rain year-round. This provides for much cleaner foliage, with reduced fungicide usage. Not only does it provide for a better appearance, but a healthier root system.

4. Provides for less fluctuation of the temperature of the roots and plant canopy. Most growers have to manage the consequences of excessive fluctuations in temperatures of canopy and roots vs. this providing the ability to proactively manage the temperatures.

5. Protects the plants from excessive cold, wind, rain, snow, and sun.

6. Minimize “outside edges” in comparison to Quonset houses. The outside edges in Quonsets made watering and plant maintenance difficult, and they were always the first to show injury due to freezing temperatures, drafts, and physical damage.

7. Provides the ability to trap heat in early spring and force emergence. Conversely, by trapping cold air, a retractable roof enables growers to maintain shorter, more compact perennials without the use of chemical or mechanical means. It allows our employees to focus on shipping in spring, rather than plant maintenance.

8. Eliminates the need to uncover/cover in early spring in fear of the late frost.

9. Reduces the labor needed to cover houses every year. Average life of the roof is five to six years.

10. Reduces the labor needed to roll the sidewalls of the Quonsets up and down on a daily basis in times of temperature fluctuations.

11. Allows greater material handling opportunities than with a ground-to-ground structure.

12. Allows more efficient labor management than with a ground-to-ground structure.

13. Accommodates the automatic environmental control systems available to the horticultural industry.

14. Provides a more comfortable work environment for employees.

### DISADVANTAGES OF RETRACTABLE ROOF GREENHOUSES VS. TRADITIONAL QUONSETS

1. Requires higher initial investment per square foot compared to a Quonset. The houses we built cost around \$7 to \$8 per square foot.

2. In our climate, they require heat for snowmelt purposes. Therefore, utilities need to be available.



3. Requires additional cost for heating.

4. Requires a flat surface on which to be constructed. They don't work well on rolling terrain.

5. Requires more maintenance for moving parts.

6. Requires the initial installation labor and training, and ongoing maintenance expertise, involved with the use of environmental control software and hardware.

7. Requires an acute awareness of construction details to minimize repairs and replacements. It is to one's advantage to spend the money for an experienced installation crew for this reason.

Riverbend Nursery currently has 4 acres of our total 14 acres of covered growing space in Cravo retractable roof houses with intentions to add future acreage as demand dictates. Our houses are equipped as follows.

- A-frame-type structure
- One house five bays wide (150 feet) by 600 feet long – total of 90,000 square feet.
- One house eight bays wide, various lengths – total of 50,000 square feet.
- One house two bays wide (60 feet) by 120 feet long – 7,200 square feet.
- Hired Hand external mount heaters for marginal heat and snow melt.
- 1 acre with horizontal heat/shade curtain. We use this area for shade plants and also for a mid-spring crop-lighting forcing with the heaters. By having a heat/shade curtain, it is more economical to heat to force growth.
- White corrugated polycarbonate gables and end walls.
- 30-inch white polycarbonate knee walls to protect the plants from wind.
- 36-inch hinged openings in the knee wall every 36 feet to provide easy access to pull orders.
- 11-foot central roadway for servicing or stocking the house.
- Controls by Q-Com to control the roof, sidewalls, heaters, and irrigation.
- 16-foot wide sliding doors on each end to allow for entrance/egress to the roadway.
- The 90,000-square-foot house is divided into five growing zones. Drop down interior curtains separate each zone, allowing for independent heating/ventilation.
- Each house is divided into numerous irrigation zones, allowing independent watering of various plant types.

In conclusion, we think the use of retractable roof greenhouses for container perennial production provides the best environment for a quality product, while minimizing losses due to overwintering.

OFA

# Letter from Washington

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**Author Note:** This article was written just following the November 5, 2002 elections. Some Congressional races remain undecided, and some important procedural questions will not be resolved until after the 107<sup>th</sup> Congress reconvenes for its final, "lame-duck" session on November 12. As a result, by the time you read this article, some of its projections may be history, while others may be consigned to the discard pile. And of course, politics being politics, many of the uncertainties will still be uncertain.

## WHAT A SURPRISE? THE 2002 CONGRESSIONAL ELECTIONS ...

By this December, Washington-watchers will have a better idea of what's going to happen in the 108<sup>th</sup> Congress. At this point, however, two days following the Republican sweep of the mid-term elections, about all that can be said with certainty is that many people are making many predictions. Following the 2000 elections, I wrote this in the *OFA Bulletin*.

"As a rule of thumb, when there is the kind of very narrow split between Republicans and Democrats that currently exists in both the House and the Senate, bipartisan cooperation is required in order to pass any legislation at all. Neither party has the votes to sustain a veto, or to force a filibuster, in most cases. The extremists

in either party are able to block action in many cases – and that can make for either a do-nothing Congress or for bad legislation ... It will continue to be very important to try to forge bipartisan strategies. The key to bipartisan strategy? What members are hearing from their constituents. Here, as in most other political arenas, it is the grassroots efforts that can tip the balance."

The situation post-election night 2002 remains much the same – with the major difference being the shift to Republican control of the Senate. However, it still requires 60 votes to block a Senate filibuster and force a vote on an issue or to pass Senate budget legislation, so the minority party (last month, the Republicans; now, the Democrats) can continue to stop action on any legislation it strongly opposes. And only a bipartisan vote can override a veto.

The Senate changeover is being credited in large part to President Bush's strong campaign efforts this fall, and so the prospects for the Bush agenda – especially on issues like the Department of Homeland Security and increased tax relief – are much strengthened. On the other hand, the 2004 Presidential campaign can be viewed as starting now, so Democrats will be unwilling to hand the President many more victories, and the Administration will be increasingly unwilling to push controversial legislation. But without getting too far afield, it is possible to make some projections about what the election's changes might bring that will be of particular significance to floriculture.

## THE FEDERAL BUDGET

Fiscal 2003 appropriations – the budgets for the various departments of the federal government – could be addressed by passing each remaining bill individually, wrapping the 11 unfinished bills into an omnibus, or passing a continuing resolution to keep the government funded through January. At this writing, incoming Senate Majority Leader Trent Lott (R-MS) has said he hopes to cut short the lame-duck session in favor of passing a continuing resolution to fund the federal government at current spending levels through early next year. Then, when the 108<sup>th</sup> Congress has been sworn in and committees have been organized, a new budget for Fiscal Year 2003 (which began last October 1, 2002 and runs through September 30, 2003) could be passed. However, the Republican appropriations chairman, current Majority Leader Tom Daschle, and many others, prefer to pass all spending bills before adjourning the 107<sup>th</sup> Congress.

The decision will impact the Floriculture and Nursery Research Initiative, the industry's ongoing successful effort to win increased USDA research dollars targeted to floral and nursery research. Initiative partners SAF and the American Nursery and Landscape Association (ANLA), with the strong and long-term support of OFA, have succeeded in leading this effort to its current level of \$5.5 million. That money is currently funding projects at land grant universities and USDA research stations across the United States. The Senate Appropriations Committee earlier this year

approved a \$750,000 increase for the Initiative, which would bring it to a new high of \$6.25 million. However, that number could change, depending upon which of the previously described scenarios takes place. At a minimum, the Initiative will receive its current spending levels, but we will continue to work to have the new \$750,000 added to the Initiative.

## HOMELAND SECURITY

President Bush has defined his top priorities for the remaining days of this Congress to include passage of terrorism insurance legislation and finalizing the new Department of Homeland Security (DHS). The plan for the new DHS would move the border inspectors of the Animal and Plant Health Inspection Service (APHIS) into the new department, but the rest of APHIS would remain in the Department of Agriculture. APHIS is charged with protecting U.S. agriculture and the environment from imported plant and animal pests and diseases. SAF and ANLA joined other agriculture groups in presenting testimony to both the House and Senate earlier this year. We expressed strong concerns about whether an effective focus on agriculture could be maintained if the entire agency were moved to the new department, so the decision to retain the policy-making, risk assessment, and other functions at USDA is a good one.

## TERRORISM INSURANCE

The pending terrorism insurance bills have been the subject of argument between the House and the Senate, and between Republicans

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## LETTER FROM WASHINGTON

*Continued from page 11*

and Democrats, for well over a year. Both chambers have passed bills, and a conference committee to resolve the differences has been working diligently for the past couple of months, with encouraging results. The final legislation will provide a federal backstop for terrorism-caused losses that are not covered by insurance policies.

Why is this important to business owners in the floral industry? The legislation is considered essential by many economists, business leaders, and by the Bush Administration, who agree that the nation's economy is suffering as real estate and other projects are delayed because of insurance uncertainty. Small-business owners are having increased difficulty in acquiring affordable property and casualty insurance as a result of the current uncertainty in the insurance industry.

Insurance policies have long excluded wars, floods, and other major disasters from coverage. Now many insurance companies have changed their contracts to exclude terrorism as a covered cause of loss, because the companies themselves cannot buy commercial reinsurance on the international markets following the events of September 11, 2001. The final compromise legislation is likely to require the insurance industry to repay some of any funds received, and to cover workers' compensation under specific circumstances.

### AGRICULTURAL GUESTWORKER (H-2A) REFORM

SAF continues to work with the Agriculture Coalition for Immigration

Reform and ANLA to urge Congress to enact a bipartisan guestworker program reform, including an adjustment of legal status for agricultural workers now illegally in the United States. The goal is not only to get a workable guestworker program, but also to address the fact that more than half of today's agricultural workers are probably illegal aliens, and to give them an opportunity to earn the right to work here legally. The Republican sweep could fuel efforts to get to a workable compromise, in part as committee chairs change on key committees in both the House and Senate.

Guestworker reform can also be expected to gain momentum as Mexico's President Vicente Fox increases pressure on the Bush Administration for immigration reform. President Fox has made several statements in recent months alluding to the importance of action – soon – on this issue, and it is important to him, politically, in Mexico's upcoming congressional elections.

### PERMANENT ESTATE TAX REPEAL

You may be thinking that, with the Republicans controlling both houses of Congress and the White House, this is a shoo-in – but don't be too sure. President Bush has indeed named further tax reform as a top priority. But it takes 60 votes to pass budget legislation in the Senate, so conservative Democrats would have to be persuaded to vote with Republicans on a form of repeal palatable to them. Perhaps more significantly, under the budget rules,

# OFA Legal Briefs

Congress can't pass a tax repeal without balancing it with spending cuts – and permanent estate tax repeal has been rated by the Congressional Budget Office as relatively costly. That means, particularly in this tight economy and tight budget, that other, less costly tax cuts may be given priority. And that is particularly true if defense costs – either for the war on terrorism or any action against Iraq, increase sharply.

### AND WHAT ELSE?

In the realm of pure speculation, it should be noted that newly re-elected Senator Susan Collins (R-ME) will chair the Senate Governmental Affairs Committee, and that both she and Senator Joe Lieberman (D-CT), the outgoing chairman, have supported making the Environmental Protection Agency a Cabinet-level department.

Senator Thad Cochran (R-MS) will assume the chairmanship of the Senate Agriculture Committee, as well as retaining his chairmanship of the Senate Agriculture Appropriations Committee. Senator Cochran has been an ally of the Floriculture and Nursery Research Initiative, and we will work to continue to increase his support for floral and nursery issues. Interestingly, Senator Cochran favors opening up agricultural sales to Cuba – a taboo among many other senior Republicans.

Senator Judd Gregg (R-NH), a conservative

Republican, will likely replace Senator Ted Kennedy (D-MA) as chairman of the Senate Health, Education, Labor and Pensions Committee. Under Gregg's leadership, some broader issues like revisions to the Family and Medical Leave Act and the Fair Labor Standards Act could also be explored by the committee.

### AND THE BOTTOM LINE ...

Washington leaders are saying, and I certainly concur, that Republicans are still going to have to put together coalitions to push their proposals. It might be tempting to assume that the wish-lists of the business community will now immediately be granted by a Republican Congress – but don't count on it. The margins in both houses are still very tight, the budget situation is not what it was a few years ago, and the international scene is anything but certain.

Let me end by repeating the words with which I began this letter. It will continue to be very important to try to forge bipartisan strategies. The key to bipartisan strategy? What members are hearing from their constituents. Here, as in most other political arenas, it is the grassroots efforts that can tip the balance. And that is where you – business owners and Congressional constituents – have an ever-increasingly important role to play. If we work together, and work hard, we can still certainly make a difference.

OFA

# HOW TO MANAGE COUNTER DISPLAYS

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The following is an article from John Stanley's best selling book *Just About Everything a Retail Manager Needs to Know*.

The counter or checkout area is a key position in any retail store. It's a location visited by every customer. Unwisely, many retailers look on this spot as the final port of call for a customer who has already decided on a purchase and sees the counter as a position where the only operation that needs to take place is the transfer of money. But the counter also provides an opportunity to sell and reinforce your store's image.

### 1. SEE THE COUNTER AS A PROFIT CENTER

Look at the counter as a department in its own right. Indeed, see it as a profit center, an ideal location for selling since every customer who has purchased products will come to this location. For this reason, the counter presents a great opportunity to sell another item or two.

### 2. SELECT THE RIGHT PRODUCTS FOR THE COUNTER

Research carried out in the United States has shown that, if the correct product is displayed and promoted at the counter, sales can increase by 40 percent. The key to selling, as always, is to display the right product, in the right place, at the right time, at the right price.

The mistake is to try to sell too many products at the counter. You will overwhelm the customer if you display more than three items. Some stores have considerable success by limiting the customer's focus to one carefully selected product.

Selecting the right product is the challenge. It should be:

- Seasonal
- Topical
- An ideal tie-in product to the majority of purchases
- An impulse item for the majority of customers
- Small
- Inexpensive, something customers can purchase with their change

The more of these criteria your selected product covers, the more sales you will make. In gas stations, chocolate bars have become the favored counter product. In supermarkets, it is often magazines.

### 3. TRAIN THE TEAM TO SELL COUNTER PRODUCTS

Train your team to see the counter area as more than simply a place to take a customer's money. Encourage them to start a conversation and to promote the product on display. The style of conversation will vary depending on the product or situation, but examples could be:

- "Have you seen our new ...? They arrived today, just in time for Christmas!"
- "Those seedling plants are a lovely choice. Do you have any snail control? With the weather getting warmer, you will need it to keep them looking their best!"
- "Have you stocked up on ... yet? They are on special at only 60 cents at the moment."

Melbourne-based Hilary Kahn of Kahn Retail Solutions conducts a workshop called *Expanding the Sale*, an ideal program to improve selling skills using these techniques at the checkout.

### 4. DO NOT CLUTTER THE COUNTER

The biggest mistake made by many retailers is that they forget about the importance of image at the counter.

More than 20 percent of your customers will remember, as a lasting impression, the counter area above all else in your store. For that reason alone, it must be kept uncluttered, clean, and tidy.

Keep your prime counter display well stocked, with a neat "reminder" sign on it to encourage customers to make that last purchase. The sign could use such words as:

- "Remember it's only ... days to Christmas."
- "Valentines Day is February 14. Remember your loved one with a few chocolate hearts."
- "New"
- "We recommend ..."
- "Don't forget ..."

### 5. LOOK PAST THE COUNTER

Retailers often get the image right on the counter, but forget what's behind the checkout personnel. Customers look in the opposite direction as your sales team, and often the sales team is blind to the clutter the customer sees when facing the counter.

Have a company policy that indicates the only messages behind the counter that are visible to the customer are those that are relevant to the customer. Take down those calendars, notes to staff, schedules, memorandums, price checks, and other irrelevant pieces of paper.

### 6. MAKE SOMEBODY ACCOUNTABLE

Put someone in charge of the counter and make them responsible for keeping the counter display well stocked and the counter area tidy. While we all tend to be guilty of messing up counters, one person should be responsible for monitoring counter cleanliness. Do a daily check to ensure that the behind-the-counter area is kept clean and tidy.

### 7. INTRODUCE HOUSEKEEPING REGULATIONS AT YOUR CHECKOUT

Remember, last impressions count. It is critical that the checkout is kept clean and tidy at all times. Therefore:

- Check the housekeeping standards at least three times a day.
- Keep the checkout dusted every day.
- Do not clutter with coffee mugs, litter, or irrelevant products.
- Never eat at the checkout or in the view of customers.
- Never leave returned/exchanged products sitting at the counter.
- Give the customer space on the counter to pack and rest purchases.

#### Management Memo

The checkout is an area where team members need to be positive with every customer. Aim to reduce staff stress by providing, if necessary:

- Carpet on the floor
- Seating
- A heater
- Regular breaks
- Job rotation

## PROMOTING INDEPENDENT GARDEN CENTERS

*Continued from page 1*

of the Cincinnati Flower Growers Association also changed from a predominantly male-oriented, wholesale grower organization to a diverse group of individuals. Presently, both retail and wholesale are equally represented in the mix, and the challenge of growing our businesses in this economic climate is a tough one. The members have always been and are still dedicated to each other's success.

From its very beginning, the Cincinnati Flower Growers Association promoted the sale of plants and flowers through collective marketing. Even though several years went by when no marketing was done, namely the '80s and '90s, increased competition placed the wheels in motion again.

The recent addition of Extension agent David Dyke served as the driving force to begin marketing the growers again. A committee was formed, headed by Christy Bard of Bard Nurseries, to look into several different venues of marketing. One shared goal was to accomplish better exposure for the organization itself through the promotion of the visible retail garden centers and florists.

The first decision made was to support Peg St. Clair in her efforts to create a Gardener's Sanctuary at Krohn Conservatory in the early spring. The growers assisted her effort with money and donated plant material. The history of the Cincinnati Flower Growers, as well as signage with the retail growers listed on it, surrounded the displays throughout the Conservatory. In addition, members of the Cincinnati Flower Growers were also able to place their own printed materials in an open kiosk at the entrance into the Krohn. A simplified brochure extolling the virtues of the Cincinnati Flower Growers was also available.

As we moved into April 2002, the Cincinnati Flower Growers sponsored a major award at the annual Cincinnati Flower Show. In addition, several growers invested time into putting in their own displays. For the fourth time, Delhi Flower & Gardens received the top award, the coveted Royal Horticultural Society Award.

The exposure the Cincinnati Flower Growers Association receives from this event is very positive. Several growers even



invited the event's tour buses to stop and see their businesses, which was a very successful and profitable activity.

Headed full bore into the spring season, Bard began working on securing sponsorship for a professional brochure, which would outline the goals of the Cincinnati Flower Growers Association and also give pertinent information about members, if they chose to be listed. She obtained sponsorship monies to help defray the cost of design and printing. A coupon in the brochure directed traffic to the retail garden centers and nurseries. It was well received and made tracking the success of the initiative possible.

Working with the Master Gardeners, several growers donated plant material for the Gateway Amphitheater Gardens at an entrance to the city. Signage let onlookers know about the Cincinnati Flower Growers Association and the names of the growers who participated in the beautification project.

More than 10,000 plants were donated to the Cincinnati Zoo & Botanical Gardens for the gardens at the Vine Street entrance to the zoo. The updated pamphlet was made available to thousands of visitors making their way through the zoo during the summer months. This exposure of the newest varieties to the public, in addition to the Association, via the pamphlet was paramount in getting our name out in the greater Cincinnati area.

Locally, we have Denny McKeown, a nationally recognized radio talk show host, extolling the virtues of independent garden centers throughout the tri-state area. In addition, Peg St. Clair features many individual businesses in her Gardener's Network publication and in her column in the *Cincinnati Enquirer* every Saturday.

Individually, garden centers have found creative ways to expose the public to their businesses. Square dances, spring and fall festivals, and open houses, charity events, and special sales are just a few. Ongoing education and tours through OFA, ANLA, and ONLA, as well as the one-on-one sharing at the grower meetings, keeps the members informed and challenged. Above all, the growers continue to share a common bond of friendship amidst competition.

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2001 Ohio Regional Poinsettia Cultivar Evaluation . . . . .	February
The Novice & Container Gardening . . . . .	February
Getting a Firm Grip on pH Drift . . . . .	March
Ornamental Grasses – The Next Wave . . . . .	March
It's Time to Talk about Profitability . . . . .	March
New OSHA Record Keeping Requirement in Effect . . . . .	March
Challenges Facing the Small to Medium Grower . . . . .	April
Planning a Fall Color Program . . . . .	May
Is an Open-Roof Greenhouse in Your Future? . . . . .	May
Integrated Diagnostics: The Basis of Plant Health Management . . . . .	May
Identifying Nutrient Disorders . . . . .	May
Strategies for Teaching Students of Floriculture . . . . .	May
Ethylene: Floriculture's Friend or Foe? . . . . .	June/July
Short Course "Teaser" 2002 . . . . .	June/July
OSHA Update . . . . .	June/July
Pest Control Outlook – Challenges and Solutions . . . . .	June/July
Enriching the Education of Floriculture Students . . . . .	June/July
Part 2: Basic Training: Surfactants, Wetting Agents, or Adjuvants . . . . .	August
Crops That Can Be Grown at Cooler Temperatures . . . . .	August
Poinsettias – Where Do We Go from Here? . . . . .	August
10 Ways to Make Pest Control Materials Work Better . . . . .	September
Structural Checklist for Building a Greenhouse . . . . .	September
Postproduction Care and Handling . . . . .	September
Overwintering Perennials Outside . . . . .	October
Potted Orchids – Popular and Profitable . . . . .	October
Successful Propagation of Vegetative Annuals . . . . .	November
Humidity Management . . . . .	November
Overwintering Container-Grown Perennials Using "Minimum Heat" Polyhut Structures . . . . .	November
Going Retail – A Case Study . . . . .	November
TopFlor™: A New Plant Growth Regulator for Height Control of Ornamentals . . . . .	November
Successful Propagation of Vegetative Annuals 2 . . . . .	December
Diseases of Perennials . . . . .	December
Overwintering Container-Grown Perennials Using Retractable Roof Greenhouse Structures . . . . .	December

### INTERIORESCAPE

Training for Plants' Sake . . . . .	March
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Water, Water Everywhere . . . . .	April
Sometimes a Great Notion . . . . .	November
Customer Retention Starts on the Inside . . . . .	November

### KIP KORNER

Kip Korner . . . . .	March
Kiplinger Chair Update . . . . .	October

### LEGAL BRIEFS

Letter from Washington . . . . .	May
Letter from Washington . . . . .	September
Letter from Washington . . . . .	December

### MANAGEMENT

Tips for a Better Relationship with Your Hispanic/Latino Workforce . . . . .	February
Branding: Is It Working? . . . . .	February
Cultivating Great Employees . . . . .	February
Branding: An Industry Joint Venture . . . . .	February
Pricing for Profit . . . . .	April
Are You Ready for a WPS Inspection? . . . . .	April
A Dollar Can Be Cheaper Than a Penny . . . . .	August
Motivating Staff toward Improved Performance . . . . .	September
Living Life with Conviction . . . . .	September
A Good Time for Safety . . . . .	October
Can Your Business Survive a Crisis? . . . . .	October

### MARKETING

How to Face Products Correctly . . . . .	October
Where Have All the Profits Gone? . . . . .	October

### OFA

A Time for Change? . . . . .	March
Nominees for 2002-03 OFA Officers & Board of Directors . . . . .	April
FIRST – Do You Know What It Is? . . . . .	April
OFA Information . . . . .	August
OFA News . . . . .	September
2001 Executive Director's Report . . . . .	October
OFA and OFAS 2001 Financial Statement . . . . .	October
OFA Membership Report . . . . .	October
OFA News . . . . .	October
OFA News . . . . .	November
OFA News . . . . .	December

### RESEARCH

Review of Research on Press Extraction . . . . .	April
Painted Pot Technology: A Novel Method of Disease Control . . . . .	August

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## KIRVEN WINS PRESTIGIOUS SAF AWARD

Dennis Kirven, OFA's immediate past executive director, was recently honored for his commitment to the Association and the industry by winning the very prestigious John H. Walker Award from the Society of American Florists (SAF).

SAF gives this award to recognize the growing importance of association executives in the workings of the Society of American Florists, and to honor the contributions of SAF's long-time executive vice president, John H. Walker.

In receiving this honor, Dennis was recognized for his ability to provide creative and substantial implementation of industry- and SAF-sponsored programs beneficial to member associations; share his management skills and abilities with associations and association executives; and foster achievements in the Association.

Congratulations, Dennis!

OFA

## PEST CONTROL FOR INTERIOR PLANTSCAPERS

### A ONE-DAY RECERTIFICATION SEMINAR

Pest Control for Interior Plantscapers will be held January 31, 2003 at the Radisson Airport Hotel, Columbus, Ohio.

This unique program is developed exclusively for interior plantscapers who need to fulfill their recertification requirements to maintain their pesticide applicator license.

The speakers will focus on disease prevention, application safety, integrated pest management, environmental considerations, and diagnostics.

Ohio-based interior plantscapers can fulfill all of their recertification requirements in one day – 1 hour of CORE credit and 5 hours of 6B commercial interior plant landscape credit.

West Virginia has approved the seminar for 11 credits in Category 4B Indoor Ornamental. Indiana, Kentucky, Michigan, and Pennsylvania have also been asked to approve these sessions for recertification credit.

For more information, visit the OFA web site at [www.ofa.org](http://www.ofa.org).

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OFA – an Association of Floriculture Professionals  
[www.ofa.org](http://www.ofa.org)

## OFA EVENT CALENDAR

### DECEMBER 2002

OFA/OSU Poinsettia Evaluation Open Houses  
See [www.ofa.org](http://www.ofa.org) for dates and locations

### JANUARY 2003

Interior Plantscape Pest Control Seminar – January 31

### FEBRUARY 2003

OFA Committee Meetings – February 21-22  
OFA Board Meeting – February 23

### JULY 2003

OFA Short Course – July 12-16  
Greater Columbus Convention Center  
Columbus, Ohio USA



## OFA PAST PRESIDENT DIES

OFA past president, William Hyde Jr., passed away October 17 following a long illness. Hyde served as president of OFA from 1977-78. He was owner and operator of Hyde Greenhouse Inc. in Avon, Ohio.

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