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**ASSOCIATION NEWS**  
**Valann Budischak**  
**Executive Director, D.N.L.A.**

Greetings to all! I hope the summer has been a busy and profitable one for all of our members. It certainly was a wet summer. A far cry from the infamous Summer of '99.

The DNLA managed to continue our good weather-good luck streak for the Summer Turf and Nursery Expo and Golf Tournament, which was held on August 17<sup>th</sup> at Garrisons Lake Golf Club in Smyrna. More than 160 people enjoyed the exhibits, interesting seminars, and pig roast. It was nice to stop, take a deep breath, and spend some time with our fellow members of the green industry. Following the pig roast, twelve foursomes blew the dust off their clubs and took to the golf course to participate in our 3<sup>rd</sup> Annual Golf Tournament. Steve Sterling, DNLA president, and myself have an invaluable role at the tournament—drivers of the beer/beverage cart and tournament spies! Although this tournament is strictly for fun, everyone takes a great interest in the progress, or lack of progress of the other foursomes. The Resort Landscaping/ Coastal team is our new tournament champion. The team was comprised of Fred Winward, Lew Winward, Scott Schubert, and Randy Bowden. Second place was awarded to the Ronny's Garden World team comprised of John Staley, John Schmidt, Bradd Yoder, and Tim Newell. Congratulations!! Thanks to our many tournament sponsors and program advertisers. Their continued support is what makes the Expo and Golf Tournament a success.

The Ornamental and Turf Workshop and Delaware Horticulture Industry Expo (DHIE) are quickly approaching. The Turf Workshop will be held on Thursday, November 9<sup>th</sup> at Hockessin Memorial Hall. Featured topics include: "Weed Control in Ornamental

Plantings"; "Balancing Soils"; "Troubleshooting Lawn Problems"; "Urban Nutrient Update"; and "Lawn Renovation/Aeration". The DHIE will be held on January 17<sup>th</sup> and 18<sup>th</sup> at the Modern Maturity Center in Dover. More information on both of these events will soon follow. Be sure to join us!

The Certified Nursery Professional Exam will be offered on Tuesday, October 24<sup>th</sup> at the Department of Agriculture in Dover. If you haven't received or have misplaced your application, please call the DNLA office.

**Welcome to our new members:**

**Sussex Irrigation**  
RD 4, Box 996  
Laurel, DE 19956  
(302) 875-3856

**Lawn & Garden Products, Inc.**  
P.O. Box 35000  
Fresno, CA 93710  
(559) 499-2100

**A Cut Above, Inc.**  
845 Old Public Road  
Hockessin, DE 19707  
(302) 239-6601

**Division of Facilities Management**  
149 Transportation Circle  
Dover, DE 19901  
(302) 739-4611

**Lowe's of Christiana #217**  
800 Eden Circle  
Bear, DE 19701

**Lowe's of Dover #27**  
1450 North DuPont Highway  
Dover, DE 19901

**Lowe's of Brandywine #622**  
3100 Brandywine Parkway, 1<sup>st</sup> Floor  
Wilmington, DE 19803

**FROM THE PRESIDENT**  
**Steve Sterling**  
**Delaware Nursery and Landscape**  
**Association**

Welcome to our new members! It is great to see the association growing at such a fast pace.

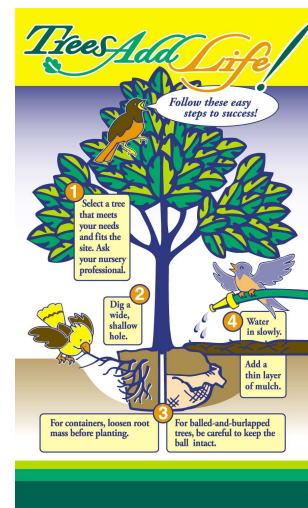
Hopefully everyone who attended our Summer Expo & Golf Tournament found it interesting and enjoyable. The continued success of these events is dependent upon our Exhibitors and Attendees. I would like to encourage everyone to do business with our exhibitors and invite others you know to contact Valann Budishak on how they could exhibit as well. We have received a lot of positive feedback from the exhibitors and look forward to seeing them again next year. I would also like to thank Valann and Sue Barton for their hard work and dedication in planning the Expo.

It's hard to believe, but Fall is just around the corner. Enjoy, I know I will.

Steven Sterling  
DNLA President

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

Trees Add Life promotional information is still available from Sunrise Marketing (888-393-4443 or [sunrisemarketing.com](http://sunrisemarketing.com)). Marketing packages include newsletter articles, posting to the website, sample tree tags, a 30 x 50 inch 4-color banner, assorted promotional templates and logos and ad slicks. The package costs \$75 (plus postage). This is a great new campaign to help you sell more trees. Over 75% of customers surveyed felt the Trees Add Life information was helpful, gave them confidence, increased their knowledge and encouraged planting. Several nursery associations have approached us with a request to promote this package through their state association (with 10% of the proceeds for sales going back to the association). This sounds like a great idea. I hope it will help to make this a truly national campaign. We hope to print promotional banners next spring and advertise again early in the spring. The final report on this research from the Food & Resource Economics Department will be available this fall. Thanks to the pilot sites in Delaware who helped make this project possible.



The drought brochure is ready! It is entitled “Dealing with Drought in the Landscape.” We will be mailing sample copies to all members with an order blank to receive additional copies if you wish to distribute them to your customers. All it took to get the wettest summer in record was for me to write a drought brochure! Oh well, I am sure we haven’t seen the last of the dry summers here in Delaware. This publication should help you and your customers take a proactive stance in future drought situations.

We have also just completed the Impacts of Urban Horticultural Practices on Nutrient Status of Ground and Surface Water in Delaware report. This report funded by DNREC and written by Helen Waite, Sue Barton, Tom Ilvento and Tom Sims will be available from the Plant & Soil Science office in October or November. It outlines the fate of applied nitrogen and phosphorus based on an extensive literature review. Then based on land uses in Delaware and surveys of various types of fertilization we have estimated nutrient inputs from urban horticulture. There is also a review of best management practices for turf fertilization. In some cases (particularly homeowners) we documented a lack of knowledge of certain best management practices (i.e. soil testing, irrigation scheduling and fall fertilization), but despite these failings, fertilizer inputs were almost always moderate and within the recommended guidelines of the University of Delaware Soiling Testing Program. This report should help the nutrient management commission understand the impacts of landscape fertilization. The report’s final recommendation is to help the landscape industry by developing checklists to help guide the preparation of nutrient management plans for residential, recreational and commercial landscapes.

**CULTURE PROFILE - TUBEROSE**  
***Polianthes tuberosa***  
**Jennifer Judson-Harms**

ASFG member Carolyne Anderson from Clark, Missouri, claims to be an amateur flower grower. But when you see pictures of her tuberose growing in a field, you’ll be likely to doubt that any “amateur” could be growing these beauties! When it comes to tuberose, Carolyne definitely rates the title of EXPERT, or at least “seasoned veteran!”

Carolyne has been growing tuberose for the past 20 years and entering them in state fair competition for as many years. Her tuberose have taken 1<sup>st</sup> place for 18 years, honorable mention one year, best of show one year, and the grand prize one year. She’s anxious to see what 2000 brings in terms of awards. This year she’ll be planting approximately 20,000 tuberose, which makes them her main crop.

Carolyne has never had a failed year since she started growing tuberose, and she is frequently asked the question, “How do you get them to bloom?” Carolyne lists what she considers to be the secret ingredients for raising tuberose as follows:

1. Plant in full sun in well-drained soil.
2. Organic fertilizer applied 3 times. First application at the time of planting, the second application at the time of emergence, and the third application when the plant produces buds. Carolyne uses horse manure but says NPK 12-12-12 can be substituted if you need to.
3. Water to the depth of 6” one time per week if you don’t have that amount in rainfall. A good soaking one time per week is optimal.

When the corms fail to bloom, it is usually due to poor planting conditions: too much shade, too many weeds, poor soil fertility, inadequate moisture, or a combination of these factors. Tuberose don't complete well with weeds, so regular weeding is a must. Like most bulb-type crops, tuberose do best if slightly crowded when they are planted. Carolyne plants in double rows that are 6" apart, with the corms planted 4" apart in the rows. They need to be planted at a depth so that just the tip is uncovered.

For blooms all season, Carolyne staggers her plantings, with the first planting being after the danger of frost is past. Subsequent plantings are approximately 3 weeks apart. Bloom time is about 12 weeks after planting, with 60-degree night temperatures being optimal to set the budheads. With the staggered plantings, Carolyne is able to cut a continuous supply of stems from July until frost, usually around mid-October in her zone.

With tuberose, pulling off the lower blooms causes the budhead to go into bloom. Carolyne sells stems with less than 12 bugles (blooms) at farmers' markets. The stems are cut when about half of the bugles are open. Cutting at this stage, the stems will last for about a week.

When she sells stems to florists, she cuts the stems that have 12-24 bugles each, with 2-3 open at the time of cutting. If the florist plans to use the stems in a day or two, she recommends keeping them at room temperature so more bugles can open. In a cooler, stems can be held for 7-10 days prior to being used. For cutting in the field, Carolyne uses a sharp kitchen paring knife, cutting the stems at a slight angle. She cuts into water and doesn't normally use floral preservatives since she delivers most stems the same day they are cut.

Flowers don't seem to be especially ethylene

sensitive. She doesn't bunch or sleeve the stems since the bugles need TLC, and she cautions against over-crowding in the bucket.

Once the tuberose begin to bloom, the hummingbirds become regular visitors and the stems become very fragrant, especially in the evening. A single cut stem will perfume your whole house. Carolyne also recommends tuberose shoulder corsages made with a whole budhead, for a fragrant delight.

If you grow tuberose in an area that isn't frost free, the corms need to be dug after the first frost. Carolyne digs the corms, chops off the tops, removes all dirt, and lightly sprinkles the corms with fungicide dust. The corms are stored at 60 degrees in a dry place in paper bags or cardboard boxes for next spring's planting. Each corm will produce many "babies" that Carolyne also saves. The babies are her future crop and get planted the following spring. A new baby will take 2-3 years to mature to production size.

Carolyne sees many possibilities for growing tuberose beyond field growing, including hoophouse and greenhouse production. Growing in a hoophouse or a greenhouse may enable growers to produce stems for June weddings, and growers in more temperate climates may be able to extend their season into the Christmas holidays.

Reprinted from *The Cut Flower Quarterly*, Volume 12, Number 3, 2000.

**COMBATING POWDERY MILDEW:  
A PROGRESS REPORT FOR 2000  
A.R. Chase, Plant Pathologist**

*New weapons, both conventional and biological, in the war against powdery mildew will provide needed help in controlling this quiet menace in specialty crops, perennials and woody ornamentals.*

There have been some interesting new developments in the fight to control powdery mildew on greenhouse ornamentals since my last article on the subject (GPN February 1999). The number of plants suffering from powdery mildew continues to increase each year as new crops are added to our product mixes. This is especially true for powdery mildew diseases on specialty cut flowers and perennials. Table 1 contains a listing of some powdery mildew diseases on several groups of ornamentals.

Some of the newest work has been performed on woody ornamentals including poinsettia, gerber daisy, hydrangea, dogwood, and many types of roses. Over the past three years more than a dozen trials have been reported on these crops, with the majority of trials performed on roses. The figure and tables in this article summarize these results as well as those for tests performed by Chase Research Gardens, Inc.

**Key Points to Combating Powdery Mildew**

1. Powdery mildew colonies, appear on surfaces of leaves, petioles, stems and flowers.
2. Powdery mildew fungi are host specific – the fungi on rose cannot attack gerber daisies or vice versa.
3. Powdery mildew is most common outdoors during the spring and fall.

4. Powdery mildew is inhibited by frequent rainfall (or overhead irrigation) and cold or hot conditions.
5. Powdery mildew spores move by air currents (wind or fans).
6. Rotate between chemical classes to stop resistance development.
7. Scout your crops to time sprays before an epidemic starts.

**Gerber Daisy and Poinsettia**

Margerey Daughtrey (Long Island Horticultural Research Laboratory) performed a trial in 1999 evaluating Heritage (1, 2 or 4-oz/100 gal). This strobilurin fungicide failed to control development of powdery mildew on leaves but gave excellent control of disease on bracts. Triact 70EC (0.5 percent on a seven-day interval), Serenade EC (3 percent on a seven-day interval) and Terraguard 50WP (8 oz on a 14-day interval) each provided excellent powdery mildew control on both leaves and bracts. Triact did cause some phytotoxicity but the other products were safe in this trial.

We have extensively tested the control of powdery mildew on gerber daisy over the past four years. Table 2 summarizes tests for 1996 through 1999. In late 1999 and early 2000, several other trials were completed. Cinnamite was used preventatively at 64 and 85 oz/100 gal on seven, 14 and 21-day intervals. It provided excellent control at 64-oz on a 14-day interval and lasted for 21 days when used at 85-oz/100 gal. BAS114UBF (a formulation of Milsana, a botanical extract) at 0.5 or 1 percent, or Strike 25W at 2 oz failed to give control. In the same trial, Triact 70EC provided excellent control when used at 0.5 or 1 percent. In the most recent trial, Cinnamite (64-oz/100 gal) provided

good control, while Pipron and Rubigan, each at 4 oz/100 gal, gave excellent control. Rubigan caused stunting and leaf distortion typical of other sterol inhibitors on gerber daisy.

### **Hydrangea and Dogwood**

Two hydrangea trials were performed for the control of powdery mildew caused by *Erysiphe polygoni*. The first was performed on plants without active powdery mildew (preventative); control was excellent with Eagle (same active ingredient as Systhane) and Heritage, and very good to excellent with 3336. Heritage applied on a 21-day interval at 4-oz/100 gal completely prevented development of powdery mildew in this trial.

The other trial was performed on hydrangea with active and severe powdery mildew. While I wouldn't advise waiting until severe disease occurs to apply a fungicide, this trial showed that many fungicides can act in a curative fashion (see Figure 1).

The best control in the trial was achieved with Systhane 40W applied at 3-oz/100 gal every 14 days. Phyton 27, Strike and Triact 70EC also provided very good to excellent control. Topshield did not provide any curative action against powdery mildew caused by *E. polygoni*.

Five trials were reported for powdery mildew (*Phyllactinia* and *Microsphaera*) control on dogwood. In these tests, most fungicides showed very good to excellent control when applied on a 14-day interval. Banner Maxx (8-oz), Bayleton (4-oz), Eagle (6 to 8-oz), and Lynx (2.22-oz) all belong to the sterol inhibitor fungicide group. This group is very active against powdery mildew diseases.

Domain and 3336 (both benzimidazoles) also gave very good to excellent control.

Likewise, Heritage (a strobilurin fungicide) gave very good to excellent control when used at rates of 4- or 8 oz on a 7-, 14- or 21-day interval.

### **Rose and Miniature Rose**

Nine trials were conducted for powdery mildew control on both garden and miniature roses. Pipron gave excellent control when used on a seven-day interval. Overall, the three bicarbonate products (eKsPunge, FirstStep and Kaligreen) provided very good to excellent control against powdery mildew on roses when used on a seven-day interval.

The sterol inhibitors (Systhane, Terraguard and Strike) also gave very good to excellent control – usually on a 14-day interval.

Copper products provided varying results: Phyton 27 gave excellent control, Camelot showed very good control and Junction provided good control.

The benzimidazole product (3336) gave excellent control when applied weekly.

All representatives of the strobilurin group (Compass, Cygnus and Heritage) gave some degree of control (even very good control) when used on a 14-day interval at rates of approximately 2-oz/100 gal. BAS114UBF (a formulation of Milsana) gave very good control when used at 0.5 percent.

Triact (Neem extract) showed excellent control when used at 1 percent on a 14-day interval.

Cinnamite (botanical extract) provided very good control and Serenade (bacterial biocontrol agent) gave excellent control when used on a seven-day interval. The fungal biocontrol agent TopShield also gave good control.

## Conclusions

One of the most interesting things I discovered during trials I conducted on powdery mildew control was that powdery mildew fungicides can be classified into at least eight distinct chemical groups (Table 4). This diversity allows most growers to rotate between the groups as a means of delaying or stopping the development of resistant powdery mildew fungi. Some of the newest products to enter the market are in the strobilurin group (Compass, Cygnus and Heritage). These product labels specifically describe resistance management strategies required to ensure that these products retain their efficacy over the long haul. What this means is that growers really have no excuse for relying on a single chemical group to control powdery mildew diseases on the majority of ornamental crops.

Indeed, the breadth of chemical groups allows growers to use “soft” chemicals such as biologicals, botanical extracts and bicarbonates. The designation “soft” refers primarily to the environmental “friendliness” of this group. Although considered “soft,” these products should still be tested on your crops for safety before broad-scale use in the greenhouse or nursery. When chosen and applied in an informed manner, each of these products have a place in the ornamental industry.

Author’s Note: The previous report was not meant as an exhaustive review of either published reports on powdery mildew control or a listing of all products used for powdery mildew control on ornamentals. This article in no way constitutes a recommendation of one product over another and is solely meant for educational purposes. Remember: the label is the law!

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**Table 1.** Ornamentals commonly affected by powdery mildew diseases.

Bedding Plants	Flowers	Perennials	Woody Ornamentals
Begonia	Dahlia	Achillea	Azalea
Calendula	Delphinium	Aquilegia	Crape myrtle
Coreopsis	Gerber daisy	Aster	Dogwood
Cosmos	Lisianthus	Lupine	Euonymus
Marigold	Miniature rose	Monardda	Hydrangea
Pansy	Poinsettia	Phlox	Lilac
Salvia	Rose	Rudbeckia	Roses
Verbena	Zinnia	Veronica	

**Table 2.** Some results from research trials conducted in 1996-1999 on control of powdery mildew on gerber daisy (Chase Research Gardens, Inc.).

Fungicide	Rate/100 gal	Percent control
Banner Maxx	6 oz	100
Cinnamite	0.5%	60
Compass 50WDG	0.5 to 1.0 oz	100
Decree 50WDG	32 oz	40-60
FirstStep	5 lbs	100
Heritage 50 WDG	1 to 16 oz	100
Kaligreen	24 oz	95
BAS114UBF (Milsana)	1%	25-90
Phyton 27	15 to 25 oz	75-90
TopShield	50 oz	40-50
Systhane 2E	3 oz	90
Terraguard	50WP 8 oz	95
Triact 70EC	1%	95

**Table 3.** Control of powdery mildew on rose and miniature rose caused by *Sphaerotheca pannosa* var. *rosae*. (VG = very good, G = good, E = excellent, S = some)

Treatment	Rate per 100 dal	Interval (days)	Result
BAS114UBF	0.5, 1 or 2 percent	14	VG
Camelot	3 or 5 pt	14	VG
Cinnamite	85 oz	7	VG
Compass 50WDG	2 oz	14-28	VG
Cygnus	1.6-3.2 oz	7-14	VG
eKsPunge**	8.3 oz	7	VG-E
FirstStep	2 or 5 ob	7	E
Hereitage 50W	1, 2 or 4 oz	14	S-VG

Junction	1.5 or 3 lbs	14	G
Kaligreen	1.5 lb	7-14	VG-E
Phyton 27	25 oz	14	E
Pipron 84.4 EC*	8 oz	7	E
Serenade	1 percent	7	E
Strike 25DF	2 oz	7	VG
Systhane 2E	3 oz	14	E
Terraguard 50W	4-8 oz	7 or 14	VG-E
TopShield	100 oz	14	S
Triact 70EC	1 percent	14	E
3336 50W*	1 lb	7	E
*Plus 2 oz/100 gal Latron B 1956			
**Plus 16 oz/100 gal Latron B 1956			

**Table 4.** Chemically distinct groups of powdery mildew fungicides.

<b>Group</b>	<b>Product(s)</b>
Benzimidazole	Domain, 3336
Bicarbonate	EKsPunge, FirstStep, Kaligreen
Biological	TopShield, Serenade
Botanical extract	BAS1114UBF, Triact, Cinnamite
Copper	Camelot, Junction, Phyton 27
Piperidin	Pipron
Sterol inhibitor	Banner Maxx, Bayleton, Eagle, Lynx, Rubigan, Strike, Systhane, Terraguard
Strobilurin	Compass, Cygnus, Heritage

## WHY HERBICIDES FAIL

### Tracing the cause requires looking at many different factors

John C. Fech

University of Nebraska

Integrated Pest Management is commonly practiced among today's grounds managers. In most cases, weeds receive the most attention among all the target pests. Sure, insects and diseases are problems, too; but, year in and year out, despite valiant efforts to exclude weeds through good fertilization, mowing, irrigation and cultivation practices, herbicides are needed to maintain quality turf.

This is justified due to the high volume of weed seed present in most soils. Of course, each soil type and geographic region has a varying amount of existing seed, but soil and weed scientists report that it is quite common for each cubic foot of soil to contain between 10 and 50,000 weed seeds.

With these factors in mind, some quantity of herbicides will be applied to landscapes, and they represent a significant cost factor to be dealt with. With pressure to keep cash outlay and application labor at a minimum, it is prudent to achieve maximum effectiveness with herbicide application.

### Limiting control factors

According to Don Suttner, Technical manager for Industrial Turf and Ornamental at Monsanto, lack of herbicide effectiveness usually falls within one of three categories: improper or incomplete mixing; spraying or application concerns; or environmental effects.

“We receive very few product performance complaints from professional turf managers as most of these individuals have used our products-and many other companies' herbicides-

for many years. Generally speaking, if there is a problem with a herbicide not performing as expected, it is often times traced to an environmental effect such as too much rain after an application of a post-emergent, or not enough moisture following an application of a herbicide that requires watering in order to be activated.”

Many factors can be responsible for herbicide applications that don't meet expectations. The bottom line is to determine which one is responsible, so that steps can be taken to prevent future problems. As you read through the following specific causes, think back to your latest herbicide fiasco. One of these could be responsible, or possibly even a combination of factors:

- **Incorrect Identification of the Weed**  
This is commonly overlooked because it's too obvious. Of course, everyone can identify a dandelion, but how about mouseeared chickweed or red sorrel? When was the last time you encountered these little known weeds and were faced with a control decision? Buy several weed identification books and place one in each company vehicle.
- **Photodecomposition**  
This factor deals with the amount of herbicide effectiveness due to the influence of sun. In most cases it is liquid applications that we are most concerned with, as these have greater exposure to the sun than granules do. The concern is that the applicator sprays them on and then due to the effects of the sun, the active ingredients are rendered inactive or reduced. Granular applications can also be affected this way, especially if the particles are left on the turf surface. The grounds manager can greatly reduce photodecomposition for granular applications by simply watering them in with a half-inch or so of irrigation water.

- **Volatilization**

Somewhat related to photodecomposition, volatilization involves upward movement of the herbicide away from the turf. This occurs by the large percent of the applied herbicide turning from a liquid state to a vapor or gaseous state. There are no weeds to kill in the air, so this is a reduction in active ingredient on the turf surface.

Volatilization can be limited by avoiding hot, windy days and choosing low volatility ingredients in herbicide products.

- **Leaching**

This occurs when the active ingredients are moved downward through the soil profile, lower than the level where the weed seeds are present. Leaching results in a diluted amount of herbicide in the zone where it is needed and, in some cases, pollution of the groundwater below the root zone of the turf plants. Leaching tends to be greater on extremely sandy soils. Turf managers can limit leaching by avoiding excessive irrigation and incorporating compost into the soil profile.

- **Adsorption**

The opposite of leaching is adsorption. This occurs when the applied herbicide becomes tightly bound to the soil particles, rendering it ineffective for use as a pest control agent. Adsorption becomes a concern when too much becomes tied up, and the herbicide concentration is greatly reduced. If this is a problem, consider topdressing with compost and/or sand to moderate the soil makeup. Actually, adsorption could be beneficial in the case of a pre-emergent herbicide that needs to be retained in the upper inch of soil to be effective.

- **Microbial Degradation**

Yet another of the many changes that can

occur after the herbicide is applied; it can degrade. The microbial population of the soil can induce this degradation. Instead of the intended scenario, where the herbicide and the microbes co-exist in harmony, when degradation occurs the microbes actually feed on the herbicide, reducing its concentration and its chemical state. The result is an ineffective compound. If this occurs, some relief can be achieved by selecting a different herbicide, one that has not been used on the site previously. The microbes may eventually feed on the new material as well, but not for a few years.

- **Temperature**

Most products are designed to work in moderate temperature conditions. When temps are cold, foliar sprays for broadleaf weeds aren't effective. Likewise, when temps are 90 degrees F and above, there is reduced effectiveness. The bigger concern with high temperatures is that the herbicide application will cause foliar burn on the turf and nearby ornamentals. Care must be taken when applying herbicides in the high end of the safe temperature range not to injure vegetable gardens and flowerbeds in close proximity to the turf.

- **Timing of the Application**

Timing is everything. If pre-emergent herbicides are applied after soil temperatures reach 55 degrees F consistently, or if the majority of the dandelions in the lawn are very large, mature specimens, then control will be difficult. Best results are achieved when pre-emergent herbicides are timed to soil temps and when post-emergent products are applied in fall soon after broadleaf weeds have germinated.

Fall is the best time for many reasons. According to Hal Dickey, Information Specialist with PBI Gordon Corp., most

perennial broadleaf weeds are storing carbohydrates and nutrients in their crowns in fall for the upcoming winter and spring. The herbicide is likely to be translocated downward along with the food. Second, newly germinated plants are easier to kill than large, mature ones. Third, if the weed doesn't die outright from the herbicide, it will be weakened, are more likely to winterkill as a result. Fourth, the neighbors with veggie gardens are likely to be less worried about a little bit of overspray in fall than they would in summer or spring.

- **Drift**

Drift is the physical movement of the herbicide away from the intended target site. Herbicides fail because drift is too great, causing the herbicide concentration to be reduced. However, the larger concern with drift is a herbicidal effect on plants or people adjacent to the sprayed area. Drift can be greatly reduced if herbicide applications are made when wind speeds are 5 mph or less.

- **Application Error**

This factor is one of those unfortunate situations where the applicator simply didn't understand which area in the park was to be treated or which lawn care customer's home to treat next. Communication skills on both the sender's (boss) and receiver's (applicator) part need to be enhanced in order to achieve improvement in this category.

- **Residual Effectiveness of Product**

Some products last a good long time, and others just a brief period. This is especially true of pre-emergent herbicides; some last only 5 to 6 weeks such as Balan or Dacthal and others will be effective for 12 to 15 weeks or more. Once the herbicide is applied, the active ingredient gradually decreases. With some herbicides, the

decrease is faster with higher soil temperatures and high soil moisture. Others are not affected by moisture or temperature.

- **Thickness of Cuticle**

This is a summertime phenomenon. In summer, most broadleaf weeds develop a thicker outer skin layer or cuticle. This is the plant's way of dealing with excessive moisture loss. It develops the waxy cuticle to help hold in adequate moisture during a hot summer. If weed control is attempted in summer, add a spreader-sticker or crop oil concentrate, or at least some dish soap to the tank mix. This will help lower the surface tension created by the cuticle and allow more herbicide to contact and remain on the weed's leaves.

- **Equipment Calibration**

One of the most dramatic factors is that of equipment calibration. Don't assume that any piece of equipment will apply exactly the desired amount of herbicide every time it is used. Orifices get plugged and worn, nozzles get bent or crushed; even tires that become lopsided can cause inaccuracies.

The best way to deal with this is a spray check. For boom sprayers, attach glass jars underneath each nozzle, let the sprayer run for a minute, then measure the amounts in each jar. In most cases, some will have put out the right amount, some less than desired, some more than desired, and some will be completely plugged, delivering no herbicide at all. For dry spreaders, mark off a 1,000-square-foot section of turf. Weigh out the correct number of pounds of product to deliver one pound of nitrogen (usually 3 to 4 pounds of product) and apply it over the 1,000-square-foot section. If there is not enough in the hopper to cover the area, or there is considerable leftover in the hopper, calibration is necessary.

- **Improper cultural practices**

In some situations, grounds managers inherit problems which stem from previous management regimes that didn't measure up. These involve fertilizer amount, formulation and timing, lack of aeration, improper height of cut, erratic irrigation, and so on. Dickey feels that mowing height is one of the most crucial, especially with broadleaf weeds. The best approach is to apply the herbicide between mowings, instead of just before a mowing when the herbicide treated tissue is removed before the active ingredients can be absorbed, or just after a mowing when the weeds have very little surface area for the herbicide to contact.

Lack of attention to cultural practices causes turf to be stressed, lowering its resistance to herbicide applications. The weather factors of rain, sun, and wind are also influential in causing herbicides to be less than effective and must be considered.

- **Choice of Herbicide**

It's possible that the wrong herbicide was taken off the shelf, or that product A was applied when product B would have been much more effective--simple errors, but significant indeed.

### **Strategies for overall effectiveness**

First and foremost--read the label. There is a tremendous amount of information about herbicide application technique and guidelines for improving control on the label. For example, there is usually information about optimal temperature range, and wind speed restrictions.

Other pertinent bits of information to pay attention to:

- Specific guidelines for the amount of the product to mix with water;

- Agitation requirements, if necessary;
- Possible need for circulation of the herbicide mixture through the hoses and spray tank;
- Size of mesh screen to use in the spray system;
- Restrictions on other products which may be perceived to enhance herbicide performance;
- Directions for the most appropriate timing of the application;
- Recommendations for the correct amount of water to use as carrier;
- Suggestions for possible use of spray pattern indicators; and
- Indications for enhancement with the addition of adjuvants, crop oil concentrates or spreader-stickers.

It's important to read and understand the label instructions. It's even more important to actually follow them. Herbicide effectiveness is not enhanced by the knowledge gain; rather, it is improved by the implementation of the recommendations and guidelines on the label.

In some cases, the management hierarchy gets in the way of effective weed control. In most cases, the owner of a lawn care company or the grounds manager have knowledge of, and can effectively utilize, good application technique. However, their job entails ordering mower parts, filing out time sheets, preparing budgets, teaching safety classes, planning new projects with stakeholders, etc. The person who actually applies the herbicide may or may not have good application knowledge and skills. This may not be through their own fault. With today's labor market, they may be newly hired staff who haven't had the opportunity to develop skills.

Therefore, it is crucial to hold regular application training sessions for new hires and updates for veteran staffers. A variety of videos and seminars are available through local Cooperative Extension offices. Pesticide and

equipment manufacturers can be very helpful in some cases as well. Several companies hold informal training sessions dealing with appropriate application techniques. Dealers can also be helpful in diagnosing “hat went wrong” or why an application failed to achieve satisfactory weed control.

### **Other efficiency benefits**

Not only will you kill more weeds with improved application techniques, there are other benefits as well. In general, when sound and successful applications are made, little or no herbicide escapes to cause environmental contamination. This is especially true of applications with reduced drift, volatilization and runoff.

Effective weed control applications have great potential to bring intangible benefits to your enterprise. When reduced to eliminate non-target damage is realized, your company is viewed as a “good neighbor” by the public. When they see your van, or members of your work crew, they will know that your workers are conscientious and careful, and that they don’t need to worry about damage to their property or their landscape plantings as a result of carelessness.

All in all, it just makes sense to learn effective application techniques, to understand why herbicide applications fail in certain instances and the steps that can be taken to minimize herbicide performance problems.

Environmental quality, reduced costs, enhanced public image and the production of quality turf are the desirable outcomes that result from attention to the details.

Reprinted from *Turf North*, July 2000.

## **MINIATURE PLANTS MEAN BIGGER BUSINESS FOR NURSERIES CATERING TO GARDEN RAILROADERS, GARDENERS WITH LITTLE GROWING SPACE**

**Christian Messa**

As interest in garden railroading has grown throughout the country, so too has the commitment by nurseries to cater to the GR hobbyists’ needs.

Those needs require a wide range of dwarf plant species that provide the perfect proportions needed to transform a simple yard into a miniature wonderland for model trains. For many garden railroaders, the true art of the hobby is to maintain the proper scale of the plants in relation to the trains, the cars of which are roughly the size of a loaf of bread. Dwarf Alberta spruce, for example, is a popular miniature tree incorporated into garden layouts because of its ideal shape and size. Garden railroading allows almost any small-leafed plant to become part of the train layout’s landscape.

While the hobby may involve pint-sized trains and plants, there is nothing diminutive about the public’s enthusiasm for it. The circulation for *Garden Railways* magazine, the primary publication dedicated to the hobby, has more than doubled over the last four years and presently stands at about 37,000. Nearly 100 garden railway societies are located throughout the United States.

A new, large clientele was not the primary reason Waynesboro, Pa., nursery owner Tom McCloud decided to service the garden railroaders—he enjoys talking to customers about the hobby since he has his own garden railroad.

“I liked it because it pulled together my hobby and business ... it just seemed like a natural fit

for us,” he said.

McCloud’s Appalachian Gardens nursery has been catering to garden railroaders for the last two years and stocks a wide assortment of miniature plants, including dwarf Alberta spruce (*Picea glauca conica*), Japanese garden juniper (*Juniperus procumbens nana*) and dwarf Hinoki cypress (*Chamaecyparis obtusa nana*). As for his best-selling plants? They are the family of dwarf evergreens.

“They grow slow and stay small and in scale,” McCloud said. “(Customers) don’t have to worry about trimming them and pruning them every year.”

Also popular are Sedums, more commonly known as stonecrop, which provide excellent small-leafed ground covers for nooks and crannies. Even herbs add a nice touch to garden railroad backgrounds. McCloud said thyme can be grown to mimic a field or meadow beside the miniature train tracks.

Bonsai, along with the dwarf species of olives (*Olea europea*), boxwoods (*Buxus microphylla*) and Hokkaido elm (*Ulmus parvifolia*), are strong sellers at Walter Andersen Nurseries. The company, which has nurseries located in the San Diego, Calif., area, has included garden railroaders among its steady stream of customers, although not because of efforts to specifically attract them to Andersen.

“I think it was more of they got to know us,” said David Ross, an Andersen store manager. “We’re known in the San Diego area for our selection, of finding more kinds of plants than anywhere else.”

To keep the customers coming back, Ross said the nursery’s plant buyers are constantly searching for stock that grows well throughout San Diego, a region that has arid and lush

environments within miles of each other. The best way for garden railroaders to ensure their miniature plants will thrive is to provide proper irrigation and soil for them, he said.

McCloud, who goes to trade shows and monitors commercial growers’ catalogs to find his plants, acknowledged garden railroaders make up only 5 percent of his total business. However, he points out his company has been actively serving them for just two years.

“It’s been positive. We’re in a learning curve and growth curve. We’re putting a lot of resources into advertising,” McCloud said.

He estimated that Appalachian Gardens has received roughly 2,000 inquiries about miniature plants since 1998 and that those inquiries have increased between 25-30 percent within the last two years.

Ross was not aware of the impact the garden railroading hobby has had on Andersen’s business but said one of the company’s nurseries has sold about \$1,500 worth of bonsai in one month alone.

McCloud said miniature plant orders typically range from \$30 to \$100 per customer. Appalachian Garden customers place orders from across the country since the company offers mail-order service exclusively to garden railroaders.

Patricia Curtis is a firm believer in mail ordering plants for the garden railroad she and husband Frank developed outside their San Diego, Calif., home. Ordering by mail opens a wider selection of plants to choose from and can be cheaper as well, she said. Curtis, who often places orders for her fellow members of the San Diego Garden Railway Society, also enjoys purchasing by mail plants that are not offered year-round by some nurseries.

She said nurseries should keep in mind that miniature plants are popular not only among garden railroaders but also those who enjoy gardening but have small yards or no yards at all, such as town home, condominium and apartment residents.

“Condo people love them because they don’t have much space. This smaller scale in bushes and trees lends itself to patios,” Curtis said. Her idea of a better nursery is one that offers a diverse selection of ground covers in the “pony pack” sizes as well as dwarf conifers that tolerate excessive sunlight.

To attract more customers like Curtis, McCloud has been advertising in Garden Railways magazine and buying booth space at large-scale model train shows.

Andersen’s promotional strategy has featured employee appearances on radio and television garden shows, Ross said.

To find out if a sizable community of garden railroaders exists in an area, both Ross and McCloud recommended nursery owners to go right to the source: Talk to hobby store employees or attend a garden railroad club meeting. Ross said the key is exposure.

“Let the people get to know you and, more importantly, get to know them.”

Kalmbach Publishing and the five largest manufacturers of large-scale equipment—AristoCraft/Polk, Bachmann Industries, Hartland Locomotive Works, LGB of America and Marklin—comprise the Large Scale Model Railroad Association.

For further information about garden railroading or how to build them, call the association toll free at (877) LGSCALE.

## Popular Small Plants for Garden Railroaders

The following is a list of popular small plants that are ideal for garden railroaders as well as those who enjoy gardening but have limited growing space, such as town home, condominium and apartment residents:

<u>Common Name</u>	<u>Botanical Name</u>
Japanese Garden Juniper	<i>Juniperus procumbens nana</i>
Hokkaido Elm	<i>Ulmus parvifolia</i>
Irish Moss	<i>Sagina subulata</i>
Scotch Moss	<i>Arenaria verna</i>
Dwarf Alberta Spruce	<i>Picea glauca conica</i>
Japanese Boxwood	<i>Buxus microphylla japonica</i>
Korean Boxwood	<i>Buxus microphylla koreana</i>
Lobelia	<i>Lobelia erinus</i>
Dwarf Pomegranate	<i>Punica granatum nana</i>
Rosemary	<i>Rosmarinus officinalis prostratus</i>
Baby’s Tears	<i>Soleirolia soleirolii</i>
Blue Star Creeper	<i>Laurentia fluviantilis</i>
Chamomile	<i>Chamaemelum nobile</i>
Corsican Mint	<i>Mentha requienii</i>
Creeping Phlox	<i>Phlox subulata</i>

### Editor's note:

Article was researched and written by Christian Messa, Motivators®, Inc., Houston, Texas. Photos of garden railroads are available; interviews with the people identified and local area modelers can be arranged by contacting the author at Motivators®, Inc., V: 713-784-5560; F: 713-784-5658 or E-Mail: [MOTIVATORS.INC@JUNO.COM](mailto:MOTIVATORS.INC@JUNO.COM)  
One time rights.

## CONGRATS TO DICK KAUFFMAN!

*Pennsylvania Landscape & Nursery Association  
Names Nurseryman, Green Achiever of the Year*

The Pennsylvania Landscape & Nursery Association (PLNA) presented two of its members with the Nurseryman of the Year Award and the first annual Green Achiever of the Year Award at the association's annual conference in State College, PA, in February.

J. Richard Kauffman, owner of London Grove Nursery Inc. in Avondale, PA, was awarded the Nurseryman of the Year Award. This honor is given in recognition of a green industry professional who has made significant contributions to Pennsylvania's horticulture industry. Kauffman has been a member of the PLNA for several years. He has served on the association's board of directors and served as PLNA president in 1992. He has been active in several of the PLNA's committees, including the planning committee, the Pennsylvania Allied Nursery Trade Show committee, audit committee, nominating committee, Pennsylvania Certified Horticulturist (PCH) committee, education committee, the Ag Arena Landscape Task Force and the career planning committee.

Kauffman is a registered landscape architect, as well as a member of the American Nursery & Landscape Association and the Delaware Association of Nurserymen.

## Publications

**The 2000 "Directory of Flower and Herb Buyers"** Lists 36 companies seeking to buy flowers, herbs, seeds, roots, and other botanicals, both wild-crafted and cultivated. Updated annually, the directory includes contacts. Cost: \$15. Order from Prairie Oak Seeds, PO Box 382, Maryville, MO 64468 (phone 660-562-3743).

**Pricing Nontraditional Products and Services (CIS942).** Written by L.D. Makus, J.F.

Guenthner, and J.C. Foltz, this 4-page 1992 fact sheet is a guide to cost-based, mark-up, demand-based, market-share, competition-based, cost-plus and market-share pricing. Cost: \$50. To order, contact Connie King, Ag Publications, University of Idaho, Moscow, ID 83844-2240, phone (208)885-7982; fax 208-885-4648; e-mail: [cking@uidaho.edu](mailto:cking@uidaho.edu)

**Surf Your Watershed.** An interesting web site that was shared with ASHS Nursery Crops Working Group during the Nutrient Management Planning for Container Nurseries workshop. Located at <http://www.epa.gov/surf3/locate>. You put in your zip code and it locates the watersheds nearest you and tells you about them; the quality of the water and watersheds vulnerability to damage. Kentucky Lake is considered better quality and low vulnerability to pollution while the Lower Cumberland (Lake Barkley) is also better quality but is vulnerable to pollution damage.

**Greenhouses for Homeowners and Gardeners.** A new 214-page publication from the Natural Resource, Agriculture, and Engineering Service (NRAES). This book covers planning, designing, and construction details for every style and type of greenhouse.

Contains eight chapters on various topics of greenhouse construction. Cost: \$25. For more information call: (607)255-7654, fax: 607-254-8770.

**Flora of North America. Vol. 22,  
Magnoliophyta: Alismatidae, Arecidae,  
Commelinidae (in part), and Zingiberidae.**

2000. Flora of North America Editorial Committee (ed.). Oxford University Press, 198 Madison Ave., New York, NY 10016-4314. Tele: 212-726-6000; [www.oup.com](http://www.oup.com). 352 pages – cost \$95 hardcover. ISBN 0-19-513729-9. Volume 22 in a 30-volume series, a synoptic floristic account of the plants of North America north of Mexico. Intended to serve both as a means of identifying plants within the region and as a systematic conspectus of the North American flora.

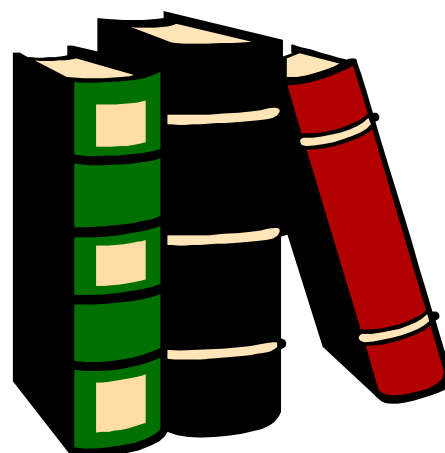
**Turf Managers' Handbook for Golf Course Construction, Renovation, and Grow-in.**

2000 Bud White. Sleeping Bear Press, 310 N. Main, Ste.300, PO Box 20, Chelsea MI 48118. Tele: 734-475-4411; fax 734-475-0787; [skp@sleepingbearpress.com](mailto:skp@sleepingbearpress.com). 281 pages. ISBN 1-57504-110-3. Practical discussion of final construction and grow-in management. Details the grow-in process and its many duties and priorities as it progresses. Agronomic theories in areas of irrigation management, fertility management, mowing philosophies, and erosion and sediment control.

**The Flower Farmer. An Organic Grower's Guide to Raising and Selling Cut Flowers.**

Lynn Byczynski. 1997. Chelsea Green Publishing Co., PO Box 428, White River Junction, VT 05001. 224 pages, 30-black and white and color photographs, 95 illustrations, softcover. \$24.95. ISBN 0-930031-94-6. Book provides information on how to grow flowers organically. Ample information on cut flower growing and marketing for growers using

traditional methods is also provided. Material is presented in a logical, chronological order that is easy to follow. She has included appendices of the USDA Plant Hardiness Map, recommended cut flowers for specific regions in the country, and provided sources and resources for growers.



# Pesticide News

## Insecticides:

**AVID** - An expanded label for Avid insecticide/miticide now allows application in some states for control of cyclamen and broad mites as well as certain eriophyid species (bud and rust mites). Specific labeling for control of boxwood leafminer has been added, as well as suppression of aphids, thrips and whiteflies. The new labeling finally provides an alternative to Thiodan (restricted-use) and Kelthane (soon to be dropped) for control of cyclamen and broad mites on greenhouse and outdoor cut flowers.

Avid was previously only labeled for use against spider mites and leafminers. Trials on Long Island have shown that Avid does provide fair to good aphid suppression and in some cases very good control of western flower thrips damage.

New wording concerning resistance management has been inserted, including restrictions against use of Avid for suppression of aphids, whiteflies and thrips on gerbera, roses and chrysanthemums. Avid should not be applied to ferns and Shasta daisy.

Results with Avid will probably be best when it is applied to tender foliage, especially on outdoor plants prior to hardening-off, since it must penetrate leaf tissue to provide long-residual control. Addition of a low rate (0.25%) of labeled horticultural oil or other adjuvant may improve foliar penetration. New mixtures should be tested first for phytotoxicity before widespread application.

Use sites include shadehouse, greenhouse, field-grown ornamentals, foliage plants, Christmas trees and other woody ornamentals. The re-entry interval for production uses remains 12 hours.

**CONFIRM T/O** (tebufenozide) – Rohm & Haas – A new formulation developed to be used on ornamental crops.

**VENDEX** (fenbutalin-oxide) – Griffin – Received EPA registration to use on greenhouse and outdoor ornamentals including nursery stock to control mites.

**BIO MITE** (gerani oil/citronellol) – Natural Plant Products – EPA received a petition to establish an exemption from residue tolerance requirements for this bio-insecticide used to control mites on a variety of agricultural and horticultural crops.

**DURSBAN/LORSBAN** (chlorpyrifos) – Dow AgroSciences – The company has voluntarily cancelled numerous uses for this product due to EPA's goal of reducing children exposure. Usage as a termiticide spot and local treatment will be allowed until 12-31-2002. As a pre-treat termiticide it will be allowed until 12-31-2005. It will remain available on non-residential usages such as golf courses, ornamental nurseries and on all agricultural crop usages except tomatoes. There will be reduced usage restrictions on apples and grapes. Retail sales of chlorpyrifos products will be allowed until 12-31-2001.

**TETRAMETHRIN** – Aventis – Due to the high cost of re-registration they have proposed to EPA to delete from their label all greenhouse usages. Unless withdrawn this will be effective on 11-27-2000. (FR Vol. 65, 5-31-2000)

## Herbicides

**ROUNDUP** (glyphosate) – Monsanto – Added to their label a cut stump application in forestry site preparation and renovation.

**AVAST** (fluridone) – Griffin – A new formulation available for aquatic weed control.

## Fungicides

PP2 1.55HG (propiconazole) – Novartis – A new formulation developed for home and garden usage to control various diseases on ornamentals, turf and trees.

PHYTON 27 (copper sulfate) – Source Tech. Biologicals – New ornamental usages include the usage on lisianthus, impatiens, periwinkle, zinnias, snapdragon, hydrangea and Indian hawthorn. Also added to the list of diseases controlled were rust, downy mildew, phytophthora and entomosporium.

BAYLETON 50 (triadimefon) – Bayer – Added to their label the control of gray leaf spot on turf.

LEEK-A-PHOS (dipotassium phosphate) – Foliar Nutrient Inc – EPA received an application to register this new active ingredient on woody ornamentals, turfgrass, non-bearing fruit and nut tree crops to control various diseases. Comments must be received by 6-9-2000. (FR Vol. 65, 5-10-2000)

## Research Briefs

### *Propagation:*

**Germination of Katsura seed improves with stratification and light.** While neither light nor stratification is required for germination, both treatments improved germination. An 8-day chilling treatment was most promotive, doubling final percent germination in both species. If seeds were stratified, light was not necessary to improve germination. Growers and conservationists should find that a brief chilling treatment will improve germination of seeds and the monitoring their sources carefully may maximize germination. (M.S. Dosmann, J.K. Isles and M.P. Widrlechner)

*Excerpted from HortTechnology Vol. 10 No. 3, July-Sept. 2000.*

**Matric priming increases wildflower germination.** Matric priming of seeds increased seedling emergence rate of six wildflower species. Seeds were mixed in fine vermiculite at 1 seed:2 vermiculite by weight. Water equal to the weight of the vermiculite was stirred into the seed-vermiculite mixture. Seeds were primed for 7 days and then dried for 7 days before sowing. For broadcast sowing the seed and vermiculite may be sown together with more dry vermiculite to aid seed dispersal immediately after priming. For plug sowing where sowing single seeds is important, the seeds are readily separated from the vermiculite by sieving. Inclusion of gibberellic acid during priming was not justified as it had a minimal effect on seedling emergence and growth. (W.G. Pill, R.H. Bender, A.C. Pie, J.K. Marvel and E.E. Veacock)

*Excerpted from J. Environ. Hort. 18(3):160-165.*

### ***Greenhouse production:***

#### **Photoperiod influence on cut flower production of *Lysimachia clethroides*.**

Photoperiod influenced both the vegetative and reproductive development of *L. clethroides*. For specialty cut flower production in greenhouses growers should provide supplemental long day lighting to promote growth and flowering. That lighting can be discontinued 3 weeks before harvest of cut flower crops. (P.M. Lewis, A.M. Armitage and J.M. Garner)

*Excerpted from HortScience Vol. 35(4):596-599.*

### ***Nursery Production:***

**Growth regulators less effective in outdoor nursery conditions.** Rates of PGR recommended for use under greenhouse conditions are less effective in controlling growth of plants produced in the nursery. For verbena, growth control was adequate in the greenhouse with all PGR-rate combinations providing an average of 17% control for 6 weeks. Under nursery conditions, only sumagic provided any growth control and it was of limited practical benefit. Herbaceous perennials produced under outdoor nursery conditions may require multiple applications or higher rates of PGRs to control growth. (S.E. Burnett, G.J. Keever, J.R. Kessler, Jr. and C.H. Gilliam)

*Excerpted from J. Environ. Hort. 18(3):166-170.*

#### **Bittercress control in container production.**

Galley provided excellent postemergence bittercress control and better subsequent preemergence control when applied to small non-flowering bittercress. As bittercress grew and matured, post and preemergence control became more difficult. Many plant species have tolerance to Galley, making it ideal for postemergence control of bittercress in

container-grown crops. (J.E. Altland, C.H. Gilliam, J.H. Edwards, G.J. Keever, J.R. Kessler and D.J. Eakes)

*Excerpted from J. Environ. Hort. 18(3):128-132.*

**Fertilization of fall flowering anemones.** N supplied three times weekly at rates of approximately 150 mg/liter (ppm), in a ratio of 1 ammonium:2 nitrate, maximizes plant growth. A somewhat lower rate of N (108 +/- 30 mg/liter (ppm)) maximizes production of propagation material. (J.B. Dubois, S.L. Warren and F.A. Blazich)

*Excerpted from J. Environ. Hort. 18(3):145-148.*

#### **Suppressing *Achillea* ‘Coronation Gold’ and *Gaura lindheimeri* ‘Corrie’s Gold’ with growth regulators.**

B-Nine, Bonzi, and Cutlass provided greater growth suppression of ‘Coronation Gold’ achillea with increased concentration of PGR. However, plant response to these PGRs appears dependent upon pruning just prior to treatment, which altered reproductive stage of development at the time of the application. B-Nine did not suppress plants with elongated reproductive shoots, but it was effective in controlling height of plants without visible reproductive shoots. Bonzi and Cutless controlled plants containing reproductive shoots (1998) and those that did not contain reproductive shoots at the time of treatment (1999). For *Gaura*, Cutless at 100 or 150 ppm was the only PGR to provide adequate control of growth. Pistill was not useful because it delayed flowering. (S.E. Burnett, G.J. Keever, C.H. Gilliam, J. R. Kessler and C. Hesselein)

*Excerpted from J. Environ. Hort. 18(3):149-153.*

### ***Landscape:***

**Performance of red maple cultivars.** Red maple cultivars were tested in Georgia for their

suitability to the coastal plain region of the Southeastern US. While DE, is usually considered Mid-Atlantic, there may be some similarities in tree performance between Georgia and southern DE. For the commercially available cultivars, the most dependable fall color occurred with ‘October Glory.’ Two new selections from the National Arboretum have also shown excellent fall color—‘Somerset’ and ‘Brandywine.’ (J.M. Ruter and J.L. Sibley)

*Excerpted from HortTechnology Vol. 10 No. 3, July-Sept. 2000.*

**Primo does not result in acceptable growth reduction.** Foliar applications of Primo at 0.5, 1.0- or 1.5 oz/gal did not result in acceptable growth reduction of forsythia, Chinese privet or waxleaf privet and only provided a transient suppression of euonymus and azalea. (M.Thetford and J.B. Berry)

*Excerpted from J. Environ. Hort. 18(3):132-136.*

#### **Diseases:**

**Black spot on roses.** Chlorothalonil could be applied less frequently to achieve the same level of black spot control when it was mixed with film-forming antitranspirants. Chlorothalonil mixed with Stressguard (0.25%) at 2-week intervals and Chlorothalonil mixed with Vapro Gard at 3-week intervals provided control equivalent to weekly applications of Chlorothalonil alone. By using antitranspirants, season-long fungicide use could be decreased by 40-69%. (R.S. Roark, K.L. Bowen and B.K. Behe)

*Excerpted from J. Environ. Hort. 18(3):137-141.*

#### **Marketing:**

**The Future of Cut Flower Marketing.** Flower and plant sales are connected directly to the

economic prosperity of a culture. Prompt delivery date and design are more crucial than price. Increased spending by consumers on enhanced merchandise where flowers and plants are only a portion of the final product was also predicted. In the retail arena supermarkets, mega-stores and other non-traditional outlets were the fastest growing market for flowers and plants. General future trends predicted include: 1) continued growth in demand for flowers and plants, 2) growth of production worldwide will be greater than demand, 3) the regional nature of production and sales will continue with some temporary worldwide trade flows, and 4) the enhancement of sales and bouquets with hardware products such as ribbons, candles, toys, dolls, etc., will increasingly use fresh flowers and plants as intermediate products. (J. Fras)

*Excerpted from Proceedings for the International Symposium on Cut Flowers in the Tropics. Acta Horticulturae 482:401-405.*

**Meeting the needs of the Horticulture Distribution Center (HDC).** HDCs are important customers for nursery selling to the landscape trade. The survey indicated that HDCs project the following changes in plant material requirements: larger plant sizes, more color items and more container plants (especially trees). HDCs would value more frequent deliveries and growers that supply previously booked plants. Growers should provide availability lists to HDCs and prepare a summary of previous purchase history for sales presentations to HDCs. (M.P. Garber and K. Bondari)

*Excerpted from J. Environ. Hort. 18(3):179-183.*

# Calendar

**September 14, 21 & 28** – Herbaceous Perennial Use, Identification and Care, Springfield, Delaware County. Penn State Cooperative Extension Smedley Park, 9am – 3pm. Contact Rick Johnson (610)690-2655, FAX: 610-690-2676.

**September 16** – 21<sup>st</sup> biennial convention of National Christmas Tree Association, Rochester, NY (800)449-1228

**September 19** – Fall preview trials of mums and pansies, Walkill View Farms, New Platz, NY (914)895-9956.

**September 20** – Lehigh County Grounds Managers Field Day & Pest Management Update, Schnecksville Fire County Pavillion. Contacts are Emelie Swackhamer (610)391-9840 or Bill Berkheimer (610)820-3129.

**September 20** – Fifth Annual Waynesboro Plant Health Care for Urban Trees, “Building a Better Tree,” Waynesboro Country Club, Waynesboro, VA, includes national speakers. For more information contact: C. Dwayne Jones at 540/942-6735, or [Parks&Rec@ci.waynesboro.va.us](mailto:Parks&Rec@ci.waynesboro.va.us), or The Virginia Urban Forest Council at 540/231-2411 (e-mail: [VUCF@vt.edu](mailto:VUCF@vt.edu)) or visit the Web site [www.fw.vt.edu/VUCF](http://www.fw.vt.edu/VUCF).

**September 20** – Grounds Manager’s Field Day and Update, Schnecksville Fire Co Pavilion, Rt 309, Schnecksville, PA. 4:30pm – 9:00pm. Deadline for registration: 8/15/00, fee \$7.00. Pesticide credits will be given. If you are a commercial firm that would like an exhibit space contact: Bill Berkheimer (610)820-3129.

**September 21** – Nursery Production Bus Tour. Sponsors: Penn State coop. Ext., Pennsylvania Landscape/Nursery Association-Chapter E-1. Registration fee is \$55 no later than 8/17/00. contact David J. Suchanic, Ext Agent, Ornamental Horticulture 610-489-4315.

**September 21** – Take a Walk on the Wild Side. The Delaware Invasive Species Council. Wander through Sussex County, DE for DISC’s first Invasive Species tour. Cost: \$10. Time 8am – 5:00 pm. Contact Heather Apostolos: (302)739-4811 or Cathy Martin (302)653-2882 for more information.

**September 23 & 24** – The Ninth Annual Weekend of Healing Plants Workshops – The Power of Herbs. The New York Botanical Garden Continuing Education, Bronx, NY 10458-5126. For information call: (718)817-

8747, fax: 718-817-8666. Cost: \$40 individual, \$60 family, \$125 supporting. Visit web site [www.nybg.org/edu/conted](http://www.nybg.org/edu/conted).

**September 23-27** – 15<sup>th</sup> International and 29<sup>th</sup> National Agricultural Plastics Congress, “Plasticulture 2000”, Hershey Lodge and Convention Center in Hershey, PA. For more information call: (814)238-7045 or visit the society’s Web site: <http://www.plasticulture.org>.

**September 26-27** – The National Arbor Day Foundation’s Fifth – Trees, People, and the Law Conference. For more information call: (402)474-5655. Complete conference brochure: [www.arborday.org/programs/tplnatlconfbrochure.html](http://www.arborday.org/programs/tplnatlconfbrochure.html) or visit website to view all our programs: [www.arborday.org](http://www.arborday.org)

**September 28** – Griffin Customer Appreciation Day. Lancaster Host Resort and Conference Center. Growers, exhibitors and nationally known speakers will participate. Pesticide credits will be awarded for DE, MD, NJ, NY and PA. Call (978) 851-4346 or visit the website [www.griffins.com](http://www.griffins.com).

**September 28** – Chester County Landscape Update meeting: Chester County Government Services Bldg., West Chester, 1-3pm. Contact: Cheryl Bjornson (610)696-3500. Pesticide update credits will be offered at the session.

**September 28** – Delaware County Landscape Update, Delaware County, Smedley Park, 6-9pm. Contact: Rick Johnson (610)690-2655. Pesticide update credits will be offered at the session.

**September 29** – Fall Weed Identification Workshop. Continuing Education Course, Longwood Gardens, Inc. Kennett Square PA 19348-0501. Session #(GS2800A) 1-4pm. Registrations may be mailed or Faxed to: 610-388-9806 Location: Acer Room/Gardens (Use Business Entrance/park in lower lot). Fee \$59. (Course is approved for 2-Core and 4-category 06 certification credits towards Pa Pesticide Applicator’s License renewal. Credit toward other state pesticide licenses may be available.

**September 29** – Planting Trees and Shrubs - Continuing Education Course, Longwood Gardens, Inc. Kennett Square PA 19348-0501. Session #(GB2400M) 9-1am. Registrations may be mailed or Faxed to: 610-388-9806 Location: Longwood Nursery (Meet at the farthest end of the Visitor Center Parking Lot. We will convoy to the Nursery). Fee: \$39.

**October 4** - Creating a Garden Chair, Delaware Center

for Horticulture, Wilmington, DE, Session 1: 1-3pm, Session 2: 5-7pm. Dan Benarcik, horticulturist at Chanticleer in Wayne, PA will give a workshop on basic designs for wooden garden furniture. Techniques to produce chairs and small tables will be demonstrated. Participants should dress appropriately. Please bring two clean rags, safety glasses, and either bungee cords or rope all other materials will be provided. Each session limited to 10 –advance registration required. Members: \$80, non: \$100.

**October 7** – Fall Perennials for the Creative Gardener. . Continuing Education Course, Longwood Gardens, Inc. Kennett Square PA 19348-0501. Session #(GS2200M) 8 – 11am. Registrations may be mailed or faxed to: 610-388-9806 Location: Visitor Center, Auditorium/Outdoors (Use Main entrance). Fee \$59.

**October 8-11**– Southern Region International Plant Propagators’ Society; Chesapeake, VA; Contact (817)882-4148, E-mail: dmorgan@bispublishing.com

**October 10** – PGMS First State Branch, Annual Business and Dinner Meeting. The “Patio” at the Lone Star Steak House, Route 13 at Hare’s Corner. Call Make Hadley at 302-475-0466 (W) or 302-764-2696 (H) or Pat Mahoney at (302) 655-6153.

**October 11** - Fall Perennials for the Creative Gardener. . Continuing Education Course, Longwood Gardens, Inc. Kennett Square PA 19348-0501. Session #(GS2300M) 8 – 11am. Registrations may be mailed or faxed to: 610-388-9806. Location: Visitor Center, Auditorium/Outdoors (Use Main entrance). Fee \$59.

**October 12 & 13** – Horticulture for Health and Human Well-being, State Arboretum of Virginia at Blandly Experimental Farm, Boyce, VA. A Conference on Using Horticultural Therapy for Professionals and Volunteers. Full conference fee:\$95. Registrations by fax (540)837-1523. More information call: Mary Olien (540)837-1758, ext. 30.

**October 14** – Tree Spree 2000, Delaware Center for Horticulture, Wilmington, DE., 10:30am – 2:20pm, Red Clay Reservation. The New Castle County Government tree Commission and DCH invite the whole family to celebrate the benefits of trees at Red Clay Reservation. Activities include nature hikes, hayrides, pruning demo’s, pioneer tool demonstration. Free native tree seedling to the first 500 attendees. Free and open to the public. Call for directions. For information, call (302)-658-6265.

**October 16-20** – Tree Climbing School, Penn State Coop.

Extension, Delaware County Smedley Park, 8am – 4:30pm. Cost: \$240, class size is limited. Contact: Rick Johnson (610)690-2655.

**October 17** – University of Maryland Cooperative Extension and the Maryland Greenhouse Growers. Md. Dept of Agriculture, Annapolis, MD. Contact Suanne Klick, (310)596.9413.

**October 17, 24, 31, Nov 7, 14** – Introduction to Garden Design. Continuing Education Course, Longwood Gardens, Inc. Kennett Square PA 19348-0501. Session #(GD2200E), 7-9:30pm. (Optional field trip, date to be announced in class) Registrations may be mailed or faxed to: 610-388-9806. Location: Visitor Center, Auditorium (Use Main entrance). Fee \$89.

**October 19-20** – Ninth Annual Pennsylvania Community Forestry Conference. Atherton Hotel 125 S. Atherton St., State College, PA. Theme: Healthy Growth of Trees and Communities. Fee-one day \$60, two day \$110. Fax:814-865-7050.

**October 24** – CNP Exam. Dept. of Agriculture, Dover, DE. Contact Val Budischak (888) 448-1203.

**October 25-28** – International Maple Symposium, The Morton Arboretum, Lisle, Illinois. The world’s maple experts will share international perspective on using maples to improve neighborhood landscapes. For more information, contact Dr. Wm Carvell, Dir. Of Education, The Morton Arboretum, 4100 Illinois Rt. 53, Lisle, IL 60532-1293, or phone 630/719-2468 or fax 630/719-2440.

**October 26-27** – “From the Ground Up,” State Arboretum of Virginia, Front Royal, VA, tree workshop, tree steward training, annual meeting, arboretum tour. Includes national speakers. For more information, contact The Virginia Urban Forest Council at 540/231-2411 or visit the Web site [www.fv.vt.edu/VUFC](http://www.fv.vt.edu/VUFC).

**November 4** - Delaware Center for Horticulture, Wilmington, DE Gardening Basics: Pruning. 10am – noon. Kris Benarcik, Education Coordinator will teach skills to keep your woody plants looking their best. Proper pruning techniques, how to remove dead wood, accentuate a plants natural shape, and discuss the proper pruning time for different plants. Members: \$5, non: \$7.

**November 9** - Delaware Ornamentals and Turf Workshop, Hockessin Memorial Hall, Hockessin, DE. 8:30 - 3:00. Contact Val Budischak, 888-448-1203.

**November 9-11** – Piedmont Ecology & Conservation Symposium 2000, Daniel Stowe Botanical Garden, Belmont, NC. Co-sponsored by Daniel Stowe Botanical Garden & Schiele Museum of Natural History & Planetarium, Inc. Includes three paper sessions and a poster session. Symposium will bring together researchers, educators and conservationists w/knowledge of and concern for Piedmont ecosystems. For more information on this symposium, visit [www.stowegarden.org/piedmont.htm](http://www.stowegarden.org/piedmont.htm), or contact symposium coordinator Don Rhoades at 704/829-1257 or e-mail [rhoades@stowegarden.org](mailto:rhoades@stowegarden.org), or Fax:704/829-1240.

**November 13** – Live interactive web-based tele-seminar. Covering latest trends in grub control and featuring Dr. Daniel Potter, Univ. of KY and Dr. David Shetlar, Ohio State Univ. View by logging on to [www.grubfree.com](http://www.grubfree.com) at 7 p.m. Eastern Standard Time. An audio version of the program can be accessed by calling the toll-free number (800) 427-6791.

**November 16** – Stream Restoration Seminar Haverford College, Marshall Auditorium, Haverford, PA. For landscape design professionals, land managers, planners, engineers, and others involved in design and oversight of streambank stabilization projects. For a complete brochure, contact (215)247-5777, ext. 156 or e-mail your address to [jlm@pobox.upenn.edu](mailto:jlm@pobox.upenn.edu).

**January 17 and 18** – Horticulture Industry Expo, Modern Maturity Center, Dover, DE Contact Val Budischak, 888-448-1203.

**January 20** – Sharpening Pruners. Continuing Education Course, Longwood Gardens, Inc. Kennett Square PA 19348-0501. Session #(GB2600M), 9-10:30am. Registrations may be mailed or faxed to: 610-388-9806 Location: Acer Room (Use the Business Entrance). Fee:\$39.

