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Editor: Susan Barton, Extension Specialist, University of Delaware
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ASSOCIATION NEWS
Valann Budischak
Executive Director, D.N.L.A.

Boy, this has been an interesting and challenging year! I heard a meteorologist say that we had more rain than Seattle this spring. I was ready to build an ark. It was mid-July before many of our members finally completed their spring commitments. Quite a difference from last spring and summer.

The DNLA board and show committees have been working hard to put together a strong line-up of interesting and educational speakers for our upcoming Ornamental & Turf Workshop (Nov. 14th in Hockessin) and DE Horticulture Industry Expo (Jan. 14th & 15th in Dover). The Nov. 14th event will feature a landscape design discussion, and an introduction to the new turf varieties. It will also feature concurrent tours. A fertigation tour will be held at Wilmington Country Club, and Dr. John Frett will host a plant walk through the UDBG. Stay tuned for more information on both of these events. If you've had the opportunity to hear a speaker that would benefit our members, please contact the DNLA office.

Our 2003 Landscape Awards deadline of September 28th is fast approaching. We are in the process of mailing the contest rules and applications to all of our members. **We encourage any/every member to submit an entry.**



U of D NEWS
Susan Barton, Extension Specialist

Delaware has been receiving some good press in the region for its proactive approach to roadside vegetation. Gary Schwetz, Rick Darke and I have all made presentations recently to a variety of audiences about the Enhancing Delaware Highways project. Departments of Transportation in other states and other land managers are looking to implement some of the creative vegetation management strategies that have worked along Delaware roadways. Vigorous woody plants like sumac and baccharis look attractive initially but can become rangy and unattractive as they grow and age. They still may not be appropriate for the small, home landscape but we have shown that boom ax mowing on a five year cycle can keep these attractive natives under control, dense and showy. Other woody plants, even some trees, like sweet gum and redbud can be managed this way for large-scale mass plantings.

The DNLA News has spent a good amount of space over the past two years covering the invasive plants issue. This issue continues to increase in prominence in the environmental community, nursery and landscape industry and even in the minds of homeowners. The DNLA is joining the University of Delaware, Delaware Center for Horticulture, Delaware Nature Society, Department of Agriculture, Mt. Cuba Center, and several local nursery industry businesses (Gateway Garden Center and North Creek Nurseries) in sponsoring a conference geared to educate interested homeowners and land managers. The conference entitled "Backyard Invaders In and Out of the Garden" will be held on Saturday, September 13, 2003 at the Delaware Center for Horticulture in Wilmington. It will include information on control of invasive plants and important discussions of the effect of invasive species on

wildlife. There will be lunch tours and a native plant sale to wrap up the conference.

The Ornamentals Short Course program has held a variety of successful classes this spring and summer. Look for the following courses in the fall:

- Plant Stress Management** – September 8, 6-8 PM, Kent County Extension Office
- Ornamentals Research Expo** – September 16, 5-8 PM, UDBG
- Pruning Workshop** – September 22, 4-6 PM, UDBG
- Urban Wildlife Control** – September 30, 6-9 PM, Kent County Extension Office
- Groundcovers** – October 7, 6-9 PM, Kent County Extension Office
- PDA Training** – October 9, 6-9 PM, New Castle County Extension Office
- Integrated Landscape Management**, October 14 & 16, 4-6 PM, NC County Extension Office
- Ornamental Grasses** – October 15, 6-8 PM, Kent County Extension Office

Welcome New Members:

Riverside Nursery
1734 Riverside Drive
Salisbury, MD 21801
(410) 742-8058

Taylor Landscape Contractors
P.O. Box 134
Hockessin, DE 19707
(610) 255-5700

ORNAMENTAL PEACH TREES FOR LANDSCAPE AND GARDEN

Dr. Ralph Scorza
**USDA-ARS Appalachian Fruit Research
Station**

Peach trees are not generally thought of in terms of ornamental value, some red-leaf and weeping types notwithstanding. But as is the case for many tree species, intensive germplasm searches have brought to light a number of interesting peach tree growth habits that have potential for use both in urban landscapes and gardens. Peach flowers can range from mundane to spectacular, the latter providing a colorful ornamental display in the spring. Flower colors range from brilliant white to varying shades of pink and red. For the past 15-20 years, the peach breeding program at the USDA-ARS Appalachian Fruit Research Station has had as a goal the development of new peach tree growth types that could be used to advantage in high-density peach production systems. Such trees would ideally require less pruning, would be more productive per unit of land and would be easier to harvest. This effort is now being realized with the introduction of columnar and upright cultivars with high quality fruit suitable for the commercial market. As part of this cultivar development program we have been working with a number of tree types including dwarf, compact, semi-dwarf, weeping, narrow-leaf, spur type, semi-columnar, and columnar. Most peach tree growth habits are single gene traits and as such are relatively easy to manipulate. As our breeding program has progressed, we have intercrossed many of these peach growth habits to develop hybrid trees with combinations of genes for several growth habits. This work has produced unique growth types such as dwarf- columnar and compact-columnar trees. The germplasm that we originally used for some of these crosses was notable for large, colorful, showy flowers. In some cases, these flowers were variegated. Some crosses

produced trees with flowers that resemble small carnations or chrysanthemums. As with tree growth habit, most of the flower traits are controlled by single genes, although there is little information on the interaction of these genes for the production of novel flower types with increased ornamental value. Many hybrids are striking in the display of color during the flowering season and in the unusual sizes and shapes of the trees. While our main interest is not in the development of ornamental peaches but in the production of commercial quality fruit cultivars, we are, also interested in further testing the ornamental value of selected trees and making them available if they are of value to the industry and consumer. These trees include the following types:

- Columnar peach trees with showy extra-petaled red, pink or white blossoms. Individual flowers on these trees may be variegated and in some cases entire branches produce flowers with varying degrees of variegation. Tree height reaches 12-15 feet.
- Short (6-8) compact, densely branching trees that produce a profusion of extra-petaled showy red, pink, or white blossoms.
- Trees with naturally ball-shaped canopies 8-10 feet in height, with showy extra-petaled blossoms.
- Dwarf trees, 2-8 feet tall, with a profusion of extra-petaled showy blossoms, some with red foliage.
- Columnar dwarfs, 2-5 feet in height, with extra-petaled showy blossoms. These unique trees appear to have potential as foundation plants.
- Narrow-leafed trees that are appealing as ornamentals due to their willowy foliage.

Some of these growth types would require little, if any, pruning to maintain their unique forms.

In our test orchard these trees attract considerable attention, particularly in the spring. Their unique growth forms appear to have a place in the home landscape. They do produce fruit in varying amounts, which, as ornamentals, could be problematic. In most cases the fruit are small, white flesh, soft and juicy. The fruit are edible, but generally not of particularly good quality, although as we improve the fruit quality of our material used for variety development, the fruit quality of ornamental types that are found in these breeding populations will continue to improve.

As part of our fruit breeding program we will continue to select peach trees with ornamental potential. Of interest are both trees that produce few or no fruit, for landscape use, and those that are both ornamental and produce high quality fruit for ornamental/home garden use. Resistance to insects and diseases and characteristics such as cold and drought hardiness are important issues that must also be addressed. While we realize that there is great potential for the ornamental use of peach trees, this potential can only be realized with an effort involving the breeding program and interested parties in the ornamental industry willing to cooperate in evaluating the material.

For further information concerning the USDA-ARS Appalachian Fruit Research peach breeding program contact:

Dr. Ralph Scorza, USDA-ARS Appalachian Fruit Research Station, 45 Wiltshire Road Kearneysville, WV 25430.

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EPA RESTRICTIONS ON CHLOROTHALONIL MAKE SENSE

**Paul Vincelli, Professor
University of Kentucky**

With this past summer being a high disease-pressure year for cool-season turfgrasses in Kentucky and other locations, fungicides have been an important tool for turf managers.

Many turf managers are aware that the label for the important contact fungicide chlorothalonil includes restrictions added relatively recently. Chlorothalonil is found in such products as Daconil, Echo, Manicure, Chlorostar and Concorde SST. This material is a low-cost fungicide with broad-spectrum activity, providing partial to complete control of important turfgrass diseases such as dollar spot, brown patch, leaf spot/melting out, gray leaf spot and others.

Two restrictions that have particular importance for use patterns for turf disease control are highlighted in this article, with an explanation of the rationale for these restrictions. This information is based on the Reregistration Eligibility Decision for chlorothalonil published in 1999 by the U.S. Environmental Protection Agency. This document is an impressive 337-page, 2-inch thick document that describes the scientific basis of EPA's decision to allow reregistration of chlorothalonil, as well as the conditions under which reregistration was permitted. Under the 1988 amendment to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), all pesticides registered before Nov. 1, 1984, must be reregistered to ensure that they meet current stringent standards.

The restrictions described below are not limited to certain soil types or turf situations, other than what is outlined in the tables. Furthermore, these restrictions cannot be waived by state regulatory agencies. State governments may

take action that is more restrictive than federal action but not less restrictive.

Use for home lawns

Chlorothalonil is no longer labeled for use on home lawns. While this restriction has been in place for several years, it is such an important one that it is worth revisiting.

Prior to the institution of this restriction, chlorothalonil was probably the No. 1 fungicide used on residential lawns. This restriction was agreed to by manufacturers of chlorothalonil in order to reduce overall exposure of two populations to the active ingredient: toddlers exposed after the application on home lawns, and residential handlers and applicators of chlorothalonil on home lawns.

Keep in mind that chlorothalonil is registered for disease control on a variety of crops, including food crops. In order to reduce overall exposure to chlorothalonil in these populations and be in compliance with the Food Quality Protection Act, manufacturers agreed to voluntarily remove home lawn uses from the label.

Use restrictions on golf courses

Chlorothalonil may be applied only according to the maximum allowable application rates given in Table 1. The restrictions outlined in Table 1 are based on ecological concerns regarding aquatic ecosystems. When applied, chlorothalonil can contaminate surface water as a result of drift or application to standing water.

After application, chlorothalonil can move to surface waters in two ways: through runoff as a dissolved chemical and through soil erosion as active ingredients are adsorbed to soil particles. Chlorothalonil is highly toxic to various aquatic organisms: fish, aquatic invertebrates, mollusks and shrimp.

I was surprised to learn that a limited number of fish kills have been documented following application of chlorothalonil, including applications to turfgrass. Although chlorothalonil is used on many crops, turfgrass uses are considered to pose a high risk to aquatic ecosystems because of the high application rates used frequently and repeatedly. EPA concluded that institution of the restrictions outlined in Table 1 would bring ecological risks from chlorothalonil applications down to an acceptable level.

An example of how these restrictions apply to a formulated product is provided in Table 2.

Honoring these restrictions

In the real world of day-to-day turf disease management, complying with the restrictions outlined in Table 1 undoubtedly poses difficulties in some instances. Some turf managers conscientiously follow these restrictions. However, when the health of a putting green, tee or fairway is on the line, a turf manager is under a lot of pressure to take all available steps to maintain turf health and may even fear for his or her job. Faced with that, the incentive to overlook these label restrictions certainly can be powerful.

It's important to understand that these restrictions are a foundation of EPA's decision to allow reregistration of chlorothalonil on turfgrasses. Violations of these restrictions not only pose the risks described above. Repeated violations also could place at risk the registration of chlorothalonil on turfgrasses. This is an important point.

While living with these restrictions can be difficult at times, consider the alternative: How much tougher would your job be if the registration for chlorothalonil use on turfgrasses were revoked? EPA did not single out turfgrasses. Similar restrictions apply to a long

list of crops. The good news for turf managers is that chlorothalonil was reregistered. But you can't assume that it will always remain registered, particularly if its use is abused.

Turf managers must experience a great deal of frustration when restrictions are imposed on pesticides that play an important role in pest management. You are the people that are directly and negatively affected by such decisions. It may help ease the frustration to know that EPA did a vast amount of careful evaluation of the science regarding chlorothalonil before making its reregistration decision. There was a solid foundation in science and in sound, balanced reasoning behind this decision, and this has been my general experience with EPA throughout my 15-year career as a professor.

It may surprise readers to learn that more chlorothalonil is used as an antifungal agent in paint than is used on golf courses. This widespread use in such a common product as paint may lead turf managers to mistakenly conclude that the environmental and public-health effects of chlorothalonil use on turfgrass must be trivial. However, there typically is no significant aquatic exposure when fresh paint is applied to walls, whereas there is definitely some potential for movement of chlorothalonil into streams, rivers, and estuaries when applied to turfgrass and other crops. Furthermore, toddlers are usually not exposed to fresh paint (and, in fact, major reductions in chlorothalonil concentration in paint have also been mandated by EPA).

Perhaps understanding the rationale for these label restrictions will provide encouragement to the turf manager to use alternative products as needed. Ask yourself why you got into turf management in the first place. Many times, it's because of a love for nature and being outdoors. Perhaps one can draw on that motivation in

those times when there is a great deal of pressure to overlook these restrictions. I'll never forget the glee with which superintendent Mark Wilson showed me the fish nests in the creek running along Valhalla CC in Louisville, the site of the 1996 and 2000 GA Tournament, proving that golf course development is perfectly at home with environmental protection. I can't imagine a better role model than that.

Alternatives to chlorothalonil

Chlorothalonil has been a widely used fungicide against a broad range of turfgrass diseases. Clearly, turf managers need to be familiar with products that can be used as alternatives to chlorothalonil.

The University of Kentucky Extension publication PpA-1, *Chemical Control of Turfgrass Diseases*, may prove useful. PPA-1 is available on the Web site at www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.pdf. PPA-1 should be used only as a starting point from which you can look into your options since products listed there may not be registered for use in your particular state.

Reprinted from Turfgrass Trends, March 2003.

LIVEN UP THE LONELY WORLD OF DRY SHADE

Nancy MicKey

The Perennial Farm, Glen Arm, MD

Editor's Note: As communities in Delaware age and trees grow, more and more folks have to deal with the problem of dry shade. Maples, often used in housing developments for their rapid growth rate, tend to have shallow root systems that compete with plants in the ground layer below them. While this season has been unusually wet, the soil under large trees may still become dry and in normal seasons will be very dry.

Here are some *drought tolerant perennials* that like dry shade. The list is not long but it is interesting. *Ceratostigma*, *Epimedium*, *Euphorbia*, Hayscented Fern, *Heuchera*, *Lamiastrum*, *Lamium*, *Heleborus*, *Houttynia*, *Tricyrtis*, Christmas Fern, *Carex*, Wood Aster, and *Chasmanthium* are just some of the dry shade perennials that I have used and been happy with.

The varied shapes and foliage colors of *Heuchera* are almost endless. *Heuchera* 'Snow Angel' has variegated green and white foliage with striking pink flowers in June. *Heuchera* 'Silver Scrolls' and *Heuchera* 'Pewter Moon' have silvery leaves with pink flowers. Fall blooming *Heuchera villosa* 'Autumn Bride' has large, velvety, light green leaves with wands of white flowers in Sept-Oct. Most *Heucheras* are evergreen, adding interest in winter as well as the rest of the year. Evergreen ferns, *Helleborus*, *Euphorbias*, *Carex* and all of the *Heucheras*, will make a fabulous winter garden landscape.

Many borderline shade/drought tolerant perennials will adapt themselves to a drier-shadier location. Experimentation is fun and educational. *Epimedium rubrum* performs

wonderfully as a ground cover for dry shady locations. The heart-shaped leaves are tinged red-bronze and the developing clusters of red starry flowers with white spurs in April/May are just perfect.

Epimedium. v. *sulphureum* has bronzy heart-shaped leaves that mature to green. The small deep yellow star-shaped flowers that bloom in April will be more visible if old foliage is removed in late winter.

Evergreen ferns including our native Christmas fern can be used as a backdrop or at the front of the border. *Carex platyphylla* is a native sedge with powder blue color that mixes well with the silver foliage of the *Heucheras*. Spreading slowly by rhizomes, this 6-12" the *Carex* provides a vertical or grass like effect in your woodland designs. A bold textured plant, *Carex platyphylla* can be used as ground cover or tucked between tree roots.

Ceratostigma plumbaginoides (Lead Wort) is one of our most useful plants, as well as having one of the longest names. Growing in full sun to part shade, this easy-to-grow perennial can be used almost anywhere. The leaves start to emerge after most perennials have sprouted, so don't despair that you lost it over the winter. The dainty foliage spreads to 1 foot and becomes a great ground cover. Intense blue flowers cover this plant in late summer into fall. Excellent for edging, or underplanting shrubs, the foliage turns deep mahogany in the fall.

Helleborus orientalis (Lenten Rose) is one of the most hotly sought after perennials. Considered by many to be a 4-season plant, blooming in early-early spring, flowers persist up to 8 weeks. Colors range from white to deep red, all colors except true blue. The sepal remains attached and adds interest as seed pods form. Several hybridizers are working day and night to expand the color palette. Magazines

and flower shows often have displays of the wide and varied flower shapes and colors. The deep green leathery evergreen foliage remains clean and healthy year round.

Tricyrtis x 'Sinonome' (Japanese Toad Lily) is one of my favorite dry shade plants. The unusual flowers look like small orchids sitting along an unbranched upright, arching stem. This cultivar has white flowers with ruby speckling, blooming from late August into October. Somewhat hairy leaves are attached alternately and have parallel veination. This late season bloomer grows well with *Heuchera villosa* 'Autumn Bride', and *Aconitum carmichaelii* 'Arendsii' for a fall garden bed. In my dry shade garden this plant lures me out to areas I usually don't see on a day-to-day schedule. Many of my native woodland wildflowers are found in the same location. It's a real treat to find such lovely flowers when most of the flowerbeds are tied and ready to retire for the winter.

Heucheras are becoming extremely popular for light to heavy shade areas. Many are drought tolerant as well, making them a very useful plant. The color range of leaves is almost endless. *Heuchera sanguinea* 'Snow Angel' has green and white mottled leaves with contrasting pink flowers. *Heuchera americana* 'Montrose Ruby' has shiny burgundy maple-shaped leaves with silver marbling, topped with dainty white bell-shaped flowers. *Heuchera chlorantha* 'Chocolae Ruffles' has incredibly ruffled chocolate brown leaves with a burgundy underside. Tiny creamy bell-shaped flowers top this unique *Heuchera*. The Perennial Plant Association selected *Heuchera micrantha* 'Palace Purple' as its 1991 Perennial Plant of the Year. Perhaps the deepest purple of the *Heucheras*, 'Palace Purple' is offset by the beautiful showy creamy/whiteflowers. *Heuchera villosa* 'Autumn Bride' is different from the other *Heuchera* with velvety, light

green leaves and fall blooming white flowers. *Heuchera* hybrids that have *americana* for one of its parents gains drought tolerance. Hybridizers choose the qualities from each species they desire and cross-pollinate, selecting from the offspring the ones they like best. *Heuchera* x 'Silver Scrolls' has metallic silvery leaves with wine-red scalloped borders, veins and underside. *Heuchera* x 'Pewer Moon' has silver-gray leaves marbled with pewter gray veins and deep maroon undersides. The pink flowers provide an exciting contrast. As you see we have a lot of different *Heucheras*. What they all have in common is that they are all evergreen and tolerate dry shade.

The list of ornamental grasses that like dry shade is a short one. One of the best is *Chasmanthium latifolium* (Northern Sea Oats). I grow this ornamental grass under a red dogwood tree, where it competes with not only the tree roots for water, but also other perennials. It does so well that I am always moving the seedlings around. This grass is native to our area with nodding oat-like seed heads that appear in late July. In the fall the foliage turns a lovely bronze. It is also attractive in cut flower or dried flower arrangements. Another good grass for dry shade is *Hystrix patula*. It has summer seed heads that make an excellent silhouette, especially against other plants. It may get floppy and is best supported by surrounding plants.

There are many perennials suitable for dry shade, in varied foliage styles, colors and flowers in every hue. Dry shade does not need to be "icky", but a challenge that is easily met.

To learn more about Dry Shade Plants or The Perennial Farm call: 410-592-6106 or visit www.perennialfarm.com

Excerpted from Free State Nursery and Landscape News, Summer 2003.

BETTER AND SAFER CONTROL OF TWO NURSERY PESTS

**Stanton A. Gill, Rondalyn Reeser and
Suzanne Klick**

Central MD Research and Education Center

Michael Raupp and Paula Shrewsbury

Department of Entomology, U of MD

Joanne Lutz

Joanne's IPM Inc.

Pests are a way of life in nursery production and nursery managers need to control major pests in the nursery. Wouldn't it be great if managers could maintain populations of beneficial organisms that exist in the nursery growing area even when they applied chemical controls? The chemical companies are introducing several new products that help growers obtain the twin goals of controlling pests and allowing many beneficial organisms to co-exist in the nursery field. Any pesticide has the chance of impacting beneficials but several of the new class of chemistries has minimal impact compared to older classes of organophosphates, carbamates and pyrethroids. In our trials conducted at the University of Maryland Central Maryland Research and Education Center and at two commercial nurseries, we evaluated two products for caterpillar control and two systemic insecticides for lace bug control.

Caterpillar Control

The larvae of moth and butterfly larvae consume huge quantities of landscape and nursery plant material each season. Caterpillars being relatively slow moving foragers have many predators and parasites that attack and feed on them. Unfortunately many of the parasites allow the caterpillars to continue to live for long enough for the insect to cause major injury to ornamental plants. In many cases a control strategy must be employed to control the caterpillar or suffer major aesthetic or health

threatening injury to the landscape ornamental plant.

For young Lepidopterous caterpillars we have the bacteria *Bacillus thuringiensis*. Many of the new formulations applied when caterpillars are small give very effective control. The problem has been that Bt is not effective on latter instars stages of Lepidopterous caterpillars. Two relatively new products have been made available that control early and late instar caterpillars, Confirm and Conserve.

What did we test?

We wanted to compare a standard carbamate, Carbaryl (Sevin) to two newer classes of chemistry available for nursery managers. Sevin insecticide has been around for over 5 decades and is very effective for caterpillar control but it has a negative impact on many beneficial organisms. Carbaryl also appears to stimulate spider mite populations when applied to mite susceptible plants in the nursery.

The objective of this trial was to evaluate the efficacy of two rates of tebufenozide (Confirm – Dow AgroSciences), Spinosyn A and Spinosyn D (Conserve-Dow AgroSciences), and Carbarl (Sevin – Union Carbide) for control of late instar larvae of bagworm, *Thyridopteryx ephemeraeformis*. The trial was performed at the Central Maryland Research and Education Center in Ellicott City, Maryland.

Materials and Methods for this Caterpillar Control Trial

On July 27, 35 Leyland cypress of 3 ft height, growing in pot in pot system, were used in our trial. Ten late instar bagworms were placed on each of 35 plants (total 350 bagworms placed on 35 plants). The bagworms took between 5-60 minutes to start feeding on their new host plants.

Five treatments were used: Control plants treated with water and Latron spreader sticker

(1.6 ml/2 liters of water); Conserve applied at 0.95 ml/2 liter and Latron 1.6 ml/2 liters of water; Confirm at 0.15 AI/100 gallons of water rate and Latron 1.6 ml/ 2 liters of water; Confirm at 0.25 AI/100 gallons of water and Latron 1.6 ml/2 liters of water; Carbaryl (Sevin) at 4 teaspoon per gallon of water and Latron 1.6 ml/2 liters of water. All plants were treated to just the start of runoff. Two liters were used to treat 7 plants for each treatment. Temperature was 81 F and relative humidity of 46%, treated at 4:00 – 5:15 p.m. on July 27th.

The treatments were made to 7 blocks and treatment within a block was randomly assigned. When a treatment was applied all of the pot plants to receive the treatment were removed and placed in an area 20 ft from the growing area. The plants were treated to avoid drifting material on the other treatments. After the pesticide dried the plants were placed back into their individual 7 blocks.

Evaluation Procedure:

Evaluation of efficacy was made on August 5th. The bagworm bags were removed from the plants, cut open and the larvae examined. Darkened, shriveled larvae were counted as dead. Live larvae were removed and probed. The color of the larvae and movement was used to determine their health. A statistical analysis of the data was conducted.

Trial results:

All materials provided significant and excellent reductions in the number of living larvae found on each plant. Sevin gave 70-80% control. Confirm at the low rate gave 95-100% control. Results indicated that the number of living larvae remaining on treated trees differed significantly ($p < 0/0001$). The average numbers of living larvae found in each treatment were as follows:

Treatment	Mean (e.e.)*
Control	8.29 (0.84) a
Confirm (low rate)	0.42 (0.20) ab
Confirm (high rate)	0.14 (0.14) bc
Conserve	0.14 (0.14) bc
Carbaryl (Sevin)	2.29 (0.74) ab

*Means that share a common letter do not differ by the results of a Nemenyi test (Zar 1999).

What does this mean for nursery managers?

Managers now have Bt, Confirm and Conserve to rotate between for controlling larvae of caterpillars that defoliate nursery trees and shrubs. These materials have short REIs (under 12 hours) and have minimal impact on beneficial wasps and other parasitoids.

Lace Bug Trials

The family of insects called Tingidae (lace bugs) are one of the most important and widespread insects of the order Hemiptera that damage and reduce the quality of nursery plants. There are over 1920 species of lace bugs in 236 genera that have been identified to date.

Azalea lace bug (*Stephanitis pyriodes*) is just one of the many lace bugs that attack nursery plant material. Azalea lace bug mainly damages azalea species but has also been reported damaging *Kalmia latifolia*. Other major lace bugs such as Rhododendron lace bug (*Stephanotis rhodendri*) damage rhododendrons and mountain laurel. Andromeda lacebug (*Stephanitis takeyai*) damages andromeda, *Leucothoe*, *Stytrax* and willow.

The feeding of lace bug is characteristic. The lace bug nymphs and adults pierce the foliage, generally feeding on the underside of the foliage, and cause a white stippling damage to the foliage. Azalea lace bug has up to 4 generations per year in Maryland and foliage by the end of the season can be appearing bleached with subsequent dropping of foliage.

Purpose of trial

To evaluate the efficacy of applications of Imidacloprid (Marathon – Olympic Chemical Company) compared to Thiamethoxam 25 WG (Flagship, proposed name, has not yet received EPA approval, - Syngenta Company) in providing control of azalea lace bug.

Trial materials and methods

The trial was conducted in the summer of 2002 at an Azalea and Rhododendron nursery, Marshy Point Nursery, Chase, Maryland. Plants used in the trial were grown in 3 gallon containers and plant material was infested with azalea lace bugs in late spring before trials were initiated. The rates tested for lace bugs for Flagship (Thiamethoxam) 25 WG were treatment one: 4 oz per acre rate, treatment two rates: 9 oz per acre rate. Imidacloprid (Marathon 60 WP) rate used was 20 grams to treat 40 (3 gallon) pots.

Results

Marathon and both rates of Thiamethoxam gave significant control compared to the untreated control, with close to 100% control of azalea lace bug for two generations of lace bug. Marathon is presently labeled for use for lace bug control. Syngenta Company has submitted its label for approval of Thiamethoxam for use in Nursery and landscapes but has not received it labels, as of the time of publication of this article.

Final Words of Wisdom

Pest will continue to plague nursery managers but the choices of lower impact pesticides are becoming more and more available for keeping the pest injury to a minimum. Choose wisely and try to select materials with minimal impact on the environment.

Reprinted from Free State Nursery and Landscape News, Summer 2003, Vol. XVI

SEVEN WAYS TO PROTECT YOUR EQUIPMENT

Bob Kinnucan, president of Kinnucan Co in Lake Bluff, Illinois, has been in business more than 30 years. During that time, he has experienced his share of equipment loss. He has also learned from these experiences to find ways to extend the life of his equipment well beyond its scheduled depreciation. Here are seven ways Kinnucan Co. works to protect one of its most important assets.

1. **Good record keeping** ... Protecting your equipment begins by keeping good records. For every piece of equipment, note purchase date, vendor, amount paid, serial number, and give a brief description.
2. **Mark equipment** ... Paint your name on it or otherwise mark your equipment. Kinnucan Co. engraves its name on the engines of its power equipment. A punch set or engraving tool works best. Take photos or a video of large, more expensive equipment. Store photos and equipment records in a safe place, preferably off-site.
3. **Accountability** ... Assigning employees to specific pieces of equipment gives them both a sense of ownership and accountability. Kinnucan Co. takes accountability a step or two farther by requiring new employees to sign an “Accountability Agreement” and by maintaining possession and usage records. Says Kinnucan, “Extensive wear and tear is the most common way equipment gets ‘lost.’ Making employees accountable for how they operate and maintain your equipment is fundamental toward extending its life.” Require employees to “log out” common equipment. Doing so offers another level of accountability.
4. **Security systems** ... Install both external and

internal security systems for your operation. Keep equipment in the yard fenced in and locked. An internal alarm system should alert authorities to a break-in, power outage, or temperature extremes.

5. Lightning protection ... If you are in an area where lightning is a concern, install a lightning rod protection system. Do not rely on surge protectors to keep your expensive computer equipment and, more important, its data safe from an electrical charge.

6. Video surveillance ... Big operators with lots of equipment and activity should install a video surveillance system. Such a system does two things: It acts as a theft deterrent and provides a video record of your facility if a theft occurs.

7. Reduce wear and tear ... “I cannot overemphasize how important it is to keep wear and tear on equipment to a minimum,” says Kinnucan. “The amount of equipment lost by abuse and poor maintenance far outweighs the amount of equipment that is lost to thieves, fires, or natural disasters.” Wear and tear can be minimized by establishing an effective preventive maintenance program and training drivers and operators on proper equipment use.

Kinnucan reemphasizes how important it is to keep good records, to have an accountability program in place, and to have zero tolerance for equipment misuse. “There is no reason why, if you purchase quality equipment and train employees on how to maintain and operate it, that it will not outlive the scheduled depreciation,” says Kinnucan. “Keeping equipment functioning and on the job is fundamental to our success – to keeping costs down and to making sure our crews are as productive as possible.”

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TARGETING THE BEST CUSTOMERS

Kathie Sevebeck, VNLA

A new national survey reports the anticipated buying trends of the American public to help retailers customize marketing. TechnoMetrica Market Intelligence conducted a computer-assisted telephone survey of 1002 households within the United States between March 3 and March 9, 2003 for the Garden Writer’s Association of American (GWAA). The survey reports garden trends for 2003.

Despite the economy, weather concerns, and the war with Iraq, a majority of American households were unphased when it comes to spending on plants this spring. Consumers plan on spending the same amount or more as they did last spring on both ornamental plants/flowers and vegetable/fruit plants. As you might expect, there are differences between what consumers in different demographic groups (age group, income level, marital status, etc.) expect to plant this year.

For example, compared with other age groups, younger consumers between the ages of 18 and 25 are more likely to increase their spending on vegetable and fruit plants.

Married couples will spend more on flowers and lawns than singles. In general, vegetable and fruit plants are preferred slightly over ornamental plants and flowers this year.

However, suburban dwellers prefer flowers more than their urban and rural counterparts. Surprisingly, the group that is most likely to increase gardening expenditures this year is those without a high school degree. Only ten percent of those surveyed said they did not plan to plant anything this spring.

The popularity of container plants may be

waning a bit as 15 percent of the households plan on spending less for this type of gardening while only 8 percent plan on spending more than last Spring. For those buying plants for use in container gardening, half of all American households plant flowers. One in five plants vegetables and fruit plants and even fewer use containers for trees and shrubs. Married couples are more likely to plant flowers in containers than singles and suburban dwellers are more likely than urban dwellers to do so. Rural dwellers are more likely to plant fruits and vegetables in containers than are suburbanites. In addition, the higher the income level, the stronger the preference for planting flowers in containers. For general gardening, lawn/grass and tree/shrub spending are top choices as income levels increase.

The demographics of those surveyed show the following profile: More survey respondents (one-quarter) were 35-44 in age with only 13 percent (the smallest bracket) in the 18-24 age group. More than half were married with 64 percent with no children under the age of 18. More than three-fourth had a high school or higher education. And 71 percent were White, non-Hispanic with 35 percent of all respondents living in the South. The majority of respondents came from urban regions (43 percent) as compared to rural (33 percent) and suburban (23 percent). Household income levels were fairly evenly split among five categories ranging from under \$75,000 to under \$20,000. Eight percent said their income was over \$100,000.

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DIAGNOSIS AND MANAGEMENT OF DAYLILY RUST

**Catherine L. Chamberlayne and Chuan
Hong**

**Hampton Roads Agricultural Research and
Extension Center, Virginia Tech**

Editor's Note: Daylily rust was announced as a new threat to perennial producers and landscape managers in the previous issue of the DNLA News. Here is some additional information about this disease.

Daylily rust, caused by the fungus *Puccinia hemerocallidis* Thuem., is a new disease in the United States causing considerable concern among daylily propagators, nurseries and home gardeners. Native to Asia, the disease was first described in Russia in 1880. In August 2000, its presence was confirmed for the first time in this country, although it may have been in the U.S. since 1998. The first confirmed infection occurred in a Georgia nursery and was followed closely by confirmed infections in Florida, Alabama and South Carolina. As of early 2003, the disease has been observed in at least 31 U.S. states, Canada, Australia and Costa Rica, and infected plants from the U.S. were intercepted *en route* to the UK. The main avenue of this rapid dissemination is international and interstate commerce - the sale or trade of infected plants. The main reason for this rapid dissemination is lack of detection. Daylily rust is causing significant concern because of the continuum of daylilies formed across the U.S. by their popularity and because of the ability of the pathogen to be transmitted undetected, and short incubation period as well as epidemic potential for the disease. Initial infections are inconspicuous to unsightly but not fatal; however, repeated infections will likely lead to plant decline or death. The pathogen also has the potential to infect *Patrinia* sp, which serves as an alternate host in nurseries and consumer environments; the most common of which is

known as ‘golden valerian.’

Signs and Symptoms

The name rust refers to the rust-colored powder (spores) produced by the fungus. Daylily rust spores range in color from orange to yellow and dark brown to black. The spores form in small, discrete masses – raised puffball-like bodies called pustules that are easily dislodged by wind, water or contact. The presence of rust pustules indicates an advanced and contagious state of the disease.

Symptoms are the result of the damage caused by the pathogen and range from a few small specks to unsightly spots, and total necrosis. In the early stages of infection, detection is difficult and elusive because symptoms may not be present. When initial symptoms do form they include small round to irregular-shape yellow or water-soaked spots, and streaks on upper and/or lower leaf surfaces and scapes. As the disease progresses, a bump (blister) may form due to the production of spores inside the leaf. As the number of spores inside the leaf increases, the blister will rupture and reveal the spore mass (pustule). Spotted leaves often become yellow or yellowish orange and dry up. There may be two distinct patterns of symptoms. Some cultivars may exhibit discrete, bright yellow spots surrounded by water-soaked tissue with no necrosis. Other cultivars may exhibit small tan, water-soaked spots surrounded by darker borders. This is occasionally accompanied by necrosis.

Detection and Diagnosis

Nurserymen and growers are advised to inspect frequently – daily is best – from first growth in spring until temperatures reach 93F, at which time the spores go dormant. During this interval inspections can decrease to weekly. Resume daily inspections in the fall when temperatures drop below 93F. The disease incubation period is short and once spores become visible the

potential for spreading the infection increases. Wear disposable gloves during the inspection process and change or disinfect gloves that you suspect may have come in contact with diseased plant. Inspect scapes and both sides of leaves. Spore masses may be tiny and the use of a hand lens may be required for detection. Different methods should be used for diagnosis in response to disease development stages.

Tissue Test - is a useful technique for diagnosing plants with severe symptoms and fungal spores. These plants usually have orange to black raised masses in addition to spots, blisters, and possibly necrosis. Carefully wipe a clean white tissue across the raised masses on an infected leaf. If a plant *is* infected by daylily rust, the raised masses will rub-off easily and leave an orange to black powdery residue on the tissue. Destroy the used tissue in a bucket of disinfectant.

Sporulation Test - is a commonly used method for diagnosing plants having spots but no fungal structures. Carefully cut samples from a cultivar and place them in a plastic bag along with a damp (not wet) paper towel to create a humidity chamber. Seal and mark the bag with the date, cultivar and any other information such as bed, row, pot, etc. that will allow the sample to be traced back to the correct spot. Before taking additional samples, spray pruners and gloves with disinfectant (70% alcohol, 10% bleach or Lysol) to prevent the possible transfer of spores. No *not* mix samples from different pots or clumps in one bag. Store the bags in a cardboard box (out of the sunlight to prevent greenhouse effects) in a room with moderate temperatures (70-75F). Check daily for orange to dark brown spores, typical of rust.

If spores form and confirmation of daylily rust is still required, take the diseased samples along with new, fresh, dry samples from the same plants to your local extension office for

examination. Include cultivar and, if new, the date and place of purchase. If this is a second submission for this cultivar or this inventory, also include the: cultivars affected, with the dates and type of treatments. Keep all samples in sealed plastic bags to prevent dissemination of spores. If possible, deliver samples in person to your local extension agent. Do not send samples through the mail. Current postal regulations require the use of radiation to protect against biological terrorism and the purpose of radiation is to kill spores. Additionally, any delay may increase the incidence of disease in your beds or inventory. Isolate suspected plant material and, if possible, cover with plastic to prevent the dissemination of spores.

Management

Viable spores of the pathogen can disseminate through shipping leafless, symptomless, tubers. This leaves control, rather than quarantine or eradication, as the only practical management option. The USDA, therefore, developed control recommendations but classified daylily rust as a “quality pest” – a classification that leaves the issue of control to individual states. Most states have reported that they are following the USDA recommendations that require nurseries with infected plants to stop selling the infected plants, to remove and destroy the infected foliage and to treat the plants with fungicides.

If infection does not exist, current inventory is best protected from this disease by the use of following preventative measures.

- Know which cultivars are most susceptible in your area and exclude them from your new purchases and, possibly, inventories. All cultivars are susceptible – only the degree of susceptibility varies. Susceptibility ranges from largely unaffected (a few small flecks) to highly susceptible

(foliage death), and various reports throughout the U.S. indicate that cultivar susceptibility may vary according to environment. Cultivars observed as highly susceptible in some regions have been observed as only moderately susceptible in other areas. Until trials are conducted in your area it may be prudent to observe the lists of susceptible cultivars reported by researchers in climates similar to your own. (Visit the websites listed at the end of this article for details).

- Before making new purchases, ask questions about the origins of the stock and about disease history.
- Carefully inspect plant material before you buy or when you receive a shipment – plants with leaves may exhibit symptoms.
- Test new purchases and isolate them from established beds or current inventory for the first season (at least 6 months).
- Treat new purchases before planting. Carefully remove all foliage except the central bud.
- Do not plant or sell the alternate host, *Patrinia* sp., of which the most common variety is known as ‘golden valerian.’ If you currently possess both species, eliminate one or relocate them to separate areas – keep in mind, the wind can carry spores for miles.
- Remove and destroy all daylily leaves at the end of the season. This includes leaf debris and remaining live leaves on semi-and evergreen cultivars. It is not known if or where spores over-winter, but removing old host tissue is a safe bet to protect against this and other pathogens. Do NOT compost these leaves. Many compost piles do not reach the temperatures required to kill spores.

- Disinfect tools and equipment with 70% alcohol, 10% bleach solution, or Lysol.
- Wash hands and clothes to prevent transmission of spores.
- Do not use an overhead watering system. Water provides an environment for germination and can wash spores on onto previously uninfected leaves.

If infection does exist, there are three options:

- Do nothing. This will lead to increased incidence of disease. The disease will likely spread disease to uninfected beds and cultivars; and, continued reinfections will likely lead to plant decline and death. This option is not available to registered nurseries or growers with compliance agreements.
- Eradicate. Carefully dig up and destroy (bury, burn or dispose in sealed plastic) infected and uninfected plants in affected beds. This will reduce or eliminate the source of inoculum. Burying is the best method of destroying the plants. Daylily rust is an obligate parasite and can't survive without living host tissue. The pathogen will perish in the soil as the plant tissue breaks down.
- Control. Currently there are no controls for existing infections other than chemical. Several biological controls (a virus and a parasitic fungus) are known to exist in the native distribution of *Puccinia hemerocallidis*, but they don't exist here. The use of chemicals will require a considerable commitment of time and money and is not a decision that should be taken lightly. Understanding the chemistry of fungicides is an important step to improve the economics of disease control.

Fungicide Basics

Systemic fungicides can penetrate and move (translocate) inside the plant to sites of infection. This allows curative or eradicated treatment of infected plants. However, these fungicides usually have a single-site mode of action. They are prone to development of fungal resistance. A systemic, *curative* fungicide acts on existing infection before symptoms develop. A systemic, *eradicator* fungicide acts on existing infection after symptoms develop. A single application of systemic fungicide will kill the susceptible spores and leave the resistant spores to repopulate. Repeated applications of the same systemic fungicide will lead to selection of resistant populations.

Contact fungicides work to protect plants from infection. They have multi-sites of action, so that fungicide resistance is not a serious issue. However, the efficacy of these fungicides is subject to complete coverage. It also is prone to washing off by rain or overhead irrigation. As a result, a single application of a contact, protectant fungicide will only protect the plant for 7-14 days and will not protect the new growth. Therefore reapplications must be made throughout the growing season.

Strobilurin fungicides, Heritage (azoxystrobin), are translaminar fungicides that diffuse (move) across the leaf surface from the site of application to the untreated parts of the leaves; the direction of diffusion includes a downward movement to the base. This reduces the error caused by improper application and increases control.

Trials to determine the efficacy of seven fungicides recommended by USDA Animal and Plant Health Inspection Service (APHIS) for control of daylily rust were conducted at the University of Georgia (Table 1). With the possible exception of Systhane (myclobutanil),

all fungicides gave good control with low disease pressure, but were not as effective with high disease pressure.

Fungicide Recommendations and Concerns

Thorough, complete coverage is necessary to ensure fungicide control. Most systemic fungicides travel from the site of absorption outwards towards the tips and margins; therefore coverage of the base of the plant is essential to ensure good control. Systemic fungicides can be more effective than contact protectants for control of daylily rust. However, repeated applications of the same systemic fungicide or those with the same mode of action increase the risk of fungicide resistance. Thus, rotation of systemic fungicides with contact protectants is recommended to increase disease control and reduce the likelihood of fungicide resistance.

The fungicides listed are formulated for commercial use. They are packaged in large quantities, are expensive and are used at rates that are not easily reduced for home use (i.e. 1-4 oz/100 gallons). Homeowner formulations for two of these fungicides exist; however, both are systemic with the same single-site mode of action. Therefore, alternating products is not

possible and the use of a single product or mode of action will lead to resistance. Small growers and collectors may wish to consider hiring commercial pesticide applicators. All growers will need to determine whether value of the crop justifies the expense of the treatment.

The application of fungicides should involve the consideration of soil permeability, water table levels, the possibility of runoff and the distance to fresh and estuarian/marine waters because most of these fungicides are toxic to aquatic animals and are known to contaminate ground water. Dithane has a maximum seasonal use limit; Daconil is not labeled for use on greenhouse crops; and, Heritage can not be used near apples.

Websites posting research updates on susceptibility of daylily cultivars:

<http://daylilies.uaex.edu/>

[www.aphis.usda.gov/npb/daylily.html#Susceptible%20Varieties:](http://www.aphis.usda.gov/npb/daylily.html#Susceptible%20Varieties)

<http://plantclinic.cornell.edu/Fact-Sheets/daylily%20rust/daylilyrust.htm>

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**EVALUATION OF BIORATIONAL
FUNGICIDES FOR THE CONTROL OF
BLACK SPOT OF ROSE, 2002.
Bob Mulrooney, University of Delaware**

This field trial was conducted at the University of Delaware Botanic Garden in Newark, DE. Bare root hybrid tea roses 'Tropicana' were planted in the spring of 2001 in a Matapeake silt loam soil, four ft apart on center. Each plot consisted of two plants, pairs were 8 ft apart on center and rows were spaced 10 ft apart. Experimental design was a randomized complete block with four replications. Weeds were controlled with glyphosate and Surflan as needed and the beds were mulched with composted woodchips for weed control and water conservation. Trickle irrigation provided water as needed during the season. The fungicides were applied to run-off with a CO₂ powered backpack sprayer equipped with a single hollow cone nozzle. Fungicide applications were initiated on 1 May and were applied weekly thereafter. Latron B-1956 spreader-sticker was added to Milsana and Eagle 40WP at each application at 0.026% v/v rate. The plots were rated on 15 Jul.

The season was hotter and drier than normal especially in June and July. Of the biorational materials tested only Sunspray UF oil provided control that might be acceptable in the home landscape. The best control was achieved with the conventional fungicide Eagle 40 WP (myclobutanil). Eagle 40WP sprayed roses were darker green and some stems had shortened internodes indicating plant growth regulator effects on 'Tropicana' at the rate and frequency of application used in this test. No other phytotoxicity was observed.

**STOP MULCH VOLCANOES!
Barbara Lupfer, Certified Arborist
Jay Banks, Certified Arborist
Leesburg, Virginia**

Fortunately, we have, at last, acquired an appreciation of the aesthetics of mulch in the landscape, somewhat like the leafmold on the forest floor. Unfortunately, our tastes are influenced by what we see, and we have seen so many wrong examples of mulch around trees and shrubs that some people think they are correct.

When you pile the wood chips or pyramids of mulch high around the base of a tree, you are simply following a common, but sadly mistaken model. In trying to control several problems, you create several new ones.

The heavy application of mulch probably got started with the simple directions to apply 4 inches of loose, course mulch. As the mulch began to decompose or just discolor and look less attractive, the application was repeated and repeated, until the original mulch was a foot or more deep.

The next logical step has been to start off with 12 to 18 inches of mulch and then keep it that keep. From these mistakes comes the multitude of problems.

Problems Associated With Over-Mulching

Incorrect mulching is a waste of time and money and is quickly becoming the number one cause of death of trees and shrubs. Overmulching, with mulch piled high, directly against the stems or trunks, smothering the root flare zone; or with very deep mulch covering part or all of the root area cause:

Root Suffocation/Root Rot – Repeated or deep applications of mulch cause waterlogged soil by slowing water loss through evaporation. Roots must “breathe”, taking in oxygen. When oxygen levels drop, root growth declines then they die, making it impossible for the plant to take up water and nutrients, leading to death.

Inner Bark Death – the living tissue (phloem) just inside the outer bark must be able to freely exchange oxygen and carbon dioxide. Mulch piled high onto the trunk decreases gas exchange, killing the inner bark and then the roots, which can no longer receive food from the leaves.

Rodent/Insect Chewing – Deep layers of mulch against the trunk provide a perfect habitat for these pests. If chewing is extensive (more than 50% of the circumference) or “girdles” the entire tree, little can be done to save the tree.

Fungal and Bacterial Diseases – These can grow and reproduce in the thick, moist mulch next to the trunk, gaining entry into the stressed, decaying bark. Once established, cankers caused by these diseases, can encircle the tree, killing the inner bark, starving the roots and killing the plant.

Excessive Heat - Thick layers of mulch begin to decay and can produce heat (similar to composting.)

Waterproof Layers – Thick layers of certain

mulches can create impervious surfaces that do not allow water to reach to roots, especially during drought. Roots dehydrate and die, killing the tree.

How roots REALLY Work

Because Roots Need Oxygen in order to grow they don't normally grow in the compacted, oxygen poor soils under paved streets.

The root collar is usually at or near the ground-line and is identifiable as a marked swelling of the tree trunk.

The framework of major roots usually lies less than 8-12 inches below the surface and often grows outward to a diameter one to two times the height of the tree.

A complex network of smaller non-woody feeder roots grow outward and upward from the framework roots. These smaller root branch 4 or more times to form fans or mats of thousands of fine, short, non-woody roots. These slender roots, with their tiny root hairs, provide the major portion of the absorption surface of a tree's root system. They compete directly with the roots of grass and other groundcovers.

Note: A few species have a taproot that grows straight down three to seven feet or more until they encounter impenetrable soil or rock layers, or reach layers with insufficient supplied of oxygen.

Between 4 and 11 major woody roots originate from the root collar and grow horizontally through the soil. These major roots branch and taper over a distance of 3-15 feet from the trunk to form an extensive framework of long, rope-like roots which as ¼ to one inch in diameter. These are important structural roots, supporting the tree against wind, etc.

Symptoms of Decline

Death from over-mulching is gradual, with symptoms sometimes taking 3-5 years to express themselves. It starts with the decline of plant vigor and rate of growth.

- Off-color leaves (pale or marbled)
- Abnormally small leaves
- Poor twig growth
- Die-back of older branches
- Rotting, peeling trunk bark under the mulch are classic signs, which get worse every year, and at which point they are recognized, it is too late to apply corrective measures.

Benefits of Proper Mulching

Good tree maintenance is common sense. It is what trees need to flourish in nature. In the wild, the forest floor is naturally covered with a layer of decomposing leaves, twigs and other plant material. In urban settings, the most common mulch is made of wood chips of varying types and sizes.

Mulch:

- Impedes growth of weeds and grass that compete with tree roots robbing them of water and nutrients.
- Conserves soil moisture by slowing down the evaporation of water from the soil surface helping to retain more water for root use for longer periods of time.
- Protects the trunk from mower/weed whacker damage by eliminating the need to mow or trim immediately around the trunk.
- Reduces soil compaction by reducing foot and vehicle traffic allowing roots to breathe.
- Moderates soil temperature keeping the roots cool in the summer and warm in the winter thereby reducing stress.
- Improves soil fertility as it decomposes.
- Prevents erosion.

- No higher than the heel of your hand, generally 2-4 inches. If using finely textured or double shredded mulch, use 1-2 inches because these materials allow less oxygen to the root zone.
- Not against the trunk – keep all mulch 3-4 inches away from the trunk of the tree or shrub, allowing the root flare zone to show just above ground level.
- To the tree's drip line if possible. Remember that the drip line moves out as the tree grows.

Other Tips:

If a "fresh" look is desired each season, take some of the old mulch away before adding a new layer to reach the 2-4" depth. Just lightly raking the existing mulch can achieve a finished look. Applying new material over old in successive years is the same as applying a too deep layer all at once!

The best way to determine if you have a mulch problem is simply to dig through the mulch layer to see how thick it really is. If it is excessive (over 4 inches), spread it out to the drip line or remove much of it. Sometimes a light raking of existing mulch is sufficient to break up any crusted or compacted layers that repel water.

A visual inspection of the root flare zone or trunk collar (where the spreading base of the tree just goes into the soil) is the best way for you or any arborist to check the condition of the trunk for possible rot, pest chewing or diseases. If detected early on, removal of mulch to allow drying out may help curb more serious problems. Complete root flare zone excavation may be necessary and is best performed by a professional arborist.

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PICK AND CHOOSE YOUR INCENTIVES

Rod Dickens, ALCA

Offering incentives to employees has become an integral part of doing business. Incentives help to keep employees on the payroll, and they encourage a myriad of good work habits-- including being on time, being productive, and being safe. The challenge with incentives, however, is there is only so much money to go around, which means employers today need to pick and choose their incentives carefully to ensure that they get the most mileage possible out of them.

Thornton Landscape, Inc. located in Maineville, Ohio, offers a number of incentives, most of which target seasonal employees. "Probably our most successful incentive is the one we awarded for perfect attendance," relates Andy Doesburg, CLP, company marketing director/account executive. "If employees do not miss a day of work and are on time every morning, they receive a \$50 bonus in their paycheck at the end of the month. The first time they receive the bonus, you can see it in their faces, 'Wow, how did I earn this?' Then, they realize it is as easy as coming to work every day, on time."

As Doesburg points out, \$50 may not seem like a lot of money, but it is a great motivator, and it adds up when employees string together a few months of perfect attendance. Then, there is the employer's perspective. "We work in a --very competitive market," relates Doesburg. "Anything we can do to enhance employee loyalty and increase our productivity will make us more competitive." Fifty dollars is a small price to pay for those dividends, he adds.

Other Incentives

The company's other incentives are also a small prize to pay for loyal workers. Among them is a new-hire bonus. Employees who refer friends

receive \$50 if their friends stay with the company for one month. If those workers stay for two months, they receive an additional \$100, and they get another \$100 if the employees they referred stay for three months -- not bad for simply getting together a friend and employer.

The company offers noncash incentives, too. For example, it reimburses the cost of the test fees for anyone who earns a state certification or who becomes a Certified Landscape Technician (CLT). Although it has only one CLT currently on board, four other employees are in the process of taking their CLT exams. "There are other ways to encourage employees to become certified," notes Doesburg. "The important point is that becoming certified at the state and national levels help to increase the skill and knowledge base of employees and gives a company a competitive advantage. Again, it is a matter of picking and choosing those incentives that work best for your company."

Sharing Success

One of the most effective incentive programs for any employer comes in the form of profit sharing. "If we are making money, we like to share it," says Doesburg. "When we have a good year, we give a year-end bonus."

"We understand that incentives, especially money incentives, are no guarantee that employees will be loyal and work hard for you every day." Doesburg emphasizes. I think being honest and treating employees right are the two best incentives for working that any company can offer. Incentives have their place, and they are most effective when they accomplish two goals -- when they encourage or reinforce a specific action and when they highlight that action as being especially important to the company."

Provided by ALCA 800-395-2522 Web Site:

www.alca.org

RETAIL NOTES FROM THE UNDERGROUND

John Peter Thompson
The Behnke Nurseries Company

We all know that “color sells” and we all know that we are in the business of selling color. But, we don’t always know how to best use color to increase our revenues. In this article I want to tell you about grays, blacks, and whites. Here goes!

In retail displays, white attracts. It not only attracts dirt, it attracts customers. Use white in your displays to punctuate, to point out, to interest. Ends of tables, edges, and borders are all traditional places to place white accents on your displays, and thus attract the customers’ interest.

Gray, on the other hand, assimilates or blends. When you have two strong colors, (that is two saturated colors or two bright colors) together, sometimes placing gray-leaved plants among or between the colors softens the clash. When your instincts tell you that a color combination is not working, try adding gray to soften the transition.

When you use black or another dark color for a table or fixtures, the colors of the plants will stand out dramatically. Greens will be greener, yellows yellowier, and reds redder. Utilizing dark, subdued colors (hues) for fixtures enhances the colors of plants displayed upon them. Use dark forest green, dark blue, dark brown, dark gray, and, of course, black, in order to showcase the colors you want your customers to see – the colors of the plants!

To the viewer, dark colors recede, and bright, hot colors come to the fore. In effect, we are playing with horizontal distances by

manipulating cool and hot colors. In retail, we must also consider vertical distances and height, so we move from color to texture. A greenhouse full of plants, displayed in quantity all at one level can be inspiring, but it can also be overwhelming. Once your color scheme has been picked, vary your shelf heights. Use boxes, crates, shelves and other fixtures to vary height, break up the wide expanse, and create the feeling of intimate rooms within a larger space. As a rule, to maintain perspective, place short plants to the front and tall ones in back.

Many shoppers “have little tolerance for having their personal space-- their ‘basic body bubble’ – violated.” (*Why We Buy: The Science of Shopping*, by Paco Underhill; Simon & Schuster; 1999.) A well thought out layout is crucial to shopping success. Remember some of the basics besides color and texture. *We Homo sapiens* are “hard wired” to look, turn, and move to the right. Consumers do not like dead-ends and cul-de-sacs, but they do like wide aisles with pull-over lanes. They do not like to be too far from the traffic flow, but to be able to move out of the flow to ponder and consider a shopping choice. Use layout, color and texture to pull people to areas off of the beaten track. Use bright colors to the left, subdued shades to the right. Tall, dramatic eye catchers should be placed down at the end of major aisle ways to pull shoppers through your store.

Above I mentioned a book by Paco Underhill, a book that I believe every retailer should own. Also, in *Family Money Magazine*, (January/February 2001) you’ll find an excellent recap of the science of selling. Great stores don’t just happen – they are planned. Don’t fool yourself into believing that you will make the right color choices and textural arrangement in the heat of spring. Take time to think about the colors, textures, and heights of your display before you set them up. Your customers will notice. After all, that’s why they come to your

store to be inspired by the varieties of colors, textures and shapes of the plants you offer.

NEWS FROM THE ANLA

Labor Set for Reform: The Fair Labor Standards Act (FLSA), the federal law that regulates such areas as how wages are paid and hours employees work, is set to be overhauled by the Bush administration in 2003. The Department of Labor (DOL) intends to publish a Notice or Proposed Rulemaking in the Federal Register by the end of February with a proposed rule to follow shortly thereafter. Once the proposed rule comes out, ANLA will have the opportunity to comment on proposed changes.

ANLA Urges Federal Quarantine Funding for Ash Borer: In a recent letter to Secretary of Agriculture, Ann M. Veneman, ANLA urged publication of a Federal quarantine for emerald ash borer (*Agrius planipennis*), and adequate funding for a program to slow the pest's spread, for research, and to compensate nurseries in the initial quarantine area for their losses. The pest, native to Asia, infests about 2,000 square miles in southeast Michigan and an unspecified area in Windsor, Ontario. Believed to be accidentally introduced on wood packaging from China, the pest is a serious threat to ash trees (genus *Fraxinus*), which are the single most important shade tree in the northern states. ANLA is also pushing for tighter inspection and compliance standards for packaging material. Questions? Contact Craig Regelbrugge.

TMDL Water Rule Withdrawn: The EPA, under heavy pressure from ANLA and other groups, withdrew on December 27 the agency's controversial attempt to regulate run-off from non-point sources into polluted water bodies. The TMDL rule, released several years ago, would have mandated that all non-point run-off sources identified as contributing to the pollution of nearby water bodies have stringent

water run-off elimination plans in place along with mandating that polluters apply for and obtain NPDES (National Pollutant Discharge Elimination Permits.) While many nurseries have systems in place to catch or filter run-off, the amount of time and money needed to apply for and receive NPDES permits would have been onerous to growers.

Methyl Bromide QPS Rule goes Final: On January 2, the EPA published the final rule concerning the process for exempting "quarantine and pre-shipment" applications for Methyl Bromide. The U.S. is scheduled to phase-out all production and consumption of Methyl Bromide by 2005, with exemptions for certain uses like those where Methyl Bromide is certified as a regulatory necessity. The EPA published an interim final rule in July 2001, which provided QPS users with an exemption from phase-out and solicited input. This month's rule finalizes the specifications for the exemption. For a copy or more information about the final rule, contact Geoff Galster.

Invasive Species Actions in the News: The following state reports underscore the need for the green industry to be engaged and proactive on the invasive species issue at federal, state and local levels.

The Vermont Department of Agriculture recently adopted a rule banning the sale or transport of almost 30 invasive exotic plants – the first such regulation in the state. For details, visit www.state.vt.us/agric/invasive.htm

Colorado banned the sale of Russian olive, increasing the list of banned species to 16. Other banned species include dame's rocket, oxeye daisy and salt cedar. This action was undertaken in consultation with industry.

A Virginia legislator introduced a bill to place English ivy (*Hedera helix*) on the state's

noxious weed list. The bill was withdrawn, but the sponsor is expected to replace that initiative with a bill that would give localities total freedom to list and ban plants deemed invasive. Such a move would leave the industry vulnerable to the tactics of local activists. Virginia green industry and agricultural groups are expected to oppose the measure.

Stay Tuned for Labor Reform Alerts:

Champions in Congress are working hard to secure a comprehensive bipartisan labor and immigration reform package. Please watch closely for calls to action if and when an opportunity materializes. Questions? Contact Craig Regalbrugge or John Meredith.

Beacon Donations Noted: The major industry-wide effort to fund reform of our nation's immigration and guest worker laws continues, in part thanks to two recent donations to ANLA's Beacon Fund. Bennett's Creek Wholesale Nursery, VA, contributed \$1,000, and the Perennial Plant Association contributed \$2,000. Both move ANLA a step closer to the \$100,000 fund raising goal for the months ahead in the new Congress. If you have questions, or would like to make a contribution, contact Craig Regelbrugge or Bob DeGermmis.

H-2A Guest Worker Employment Growing:

Just a few years ago, the first nursery and landscape industry employers began to turn to the H-2A and H-2B guest worker programs as a last resort source of needed labor. While each of the programs has risks and limitations that ANLA is working to resolve, their use has steadily increased in recent years. For the H-2A (agricultural) program, by the end of the 201 government fiscal year, the U.S. Department of Labor had certified 3,068 nursery job opportunities for guest workers. It is expected that temporary visas were ultimately issued for guest workers to fill these job opportunities. Top destinations for nursery guest workers in

2001 by state: Tennessee (595); Ohio (551); Maryland (278); South Carolina (260); and Alabama (225).

A GUIDE TO DIAGNOSING DISEASES OF LANDSCAPE PLANTS

**Chuan Hong, Tom Banko and Marcia Stefani
Virginia Cooperative Extension**

What Causes Landscape Plant Failure

Plant failures are common in the landscape. Some occur soon after planting, while others develop over time. "What causes plant failures in the landscape?" is a question that homeowners, landscapers, contractors and educators frequently ask. Answers to this question will help not only to diagnose, but also to prevent similar problems in the future.

In Virginia, analysis of plant disease samples received from the local landscape industry and homeowners reveals that environmental stresses and/or improper cultural practices are the primary causes of plant failure in the landscape. The majority of plant failures occur soon after planting. The transition from container-growth, under controlled conditions in a nursery, to the landscape can be very difficult. If an appropriate planting site and proper cultural conditions are not provided, the plant will not establish adequately, and is likely to die. Frequently, insufficient irrigation during the establishment period is a major cause of plant failure. However, too much water due to severe weather, watering too frequently, or poor soil drainage may also cause plants to die or become diseased. Salinity of the soil and the quality of well water used for irrigation are other common concerns in the eastern part of the mid-Atlantic region.

Actual plant pathogens are generally a secondary cause of plant failure or decline in the landscape. Plant pathogens may include fungi, viruses, bacteria or nematodes with most problems caused by fungi. Disease

development of this type also is subject to weather conditions and cultural practices. Commercial nurseries maintain healthy plants with regular fungicide programs. However, after transplanting into the landscape, unprotected plants may become diseased. Disease can develop soon after planting or develop after a year or more, depending on the plant, the type of pathogen, and environmental stress.

A less common cause of plant failure is insect damage. Sometimes it is difficult to distinguish disease symptoms from insect damage. It is also difficult to make a disease diagnosis on an unknown or new plant species. Landscape plant species are very diverse, and if the normal appearance of a plant is not known, diagnosis may not be possible. Other signs and symptoms that are often confused with diseases include normal leaf variegation, corky ridges on stems, lack of flowers, and normal leaf senescence and drop, particularly associated with the springtime leaf senescence of broadleaf evergreens or fall needle senescence of conifers.

The first steps in attempting to diagnose a plant problem are to determine (i) what the plant is, (ii) what it is supposed to look like, and (iii) what environmental conditions it requires.

Keeping this information in mind should help you to learn what to look for in diagnosing plant problems. Characteristics of the plant, environmental conditions, and cultural practices utilized should be the first things to determine, followed by observation of signs and symptoms of plant pathogens.

Do-it-yourself Guidelines and Tools

Can you diagnose plant failure by yourself? The answer is ‘Yes’ for most situations. The do-it-yourself guidelines below provide a list of what to look for, basic tools, and step-by-step procedures. These procedures will guide you in

examining a sample, and in narrowing down the possible causes of the problem as closely as necessary to make decisions for disease management.

What to look for. Plant pathologists usually group causes of plant failure into two categories: *infectious* (that is caused by a pathogen(s)), and *noninfectious* (caused by environmental stress or improper cultural practices). Identifying whether a problem is infectious or noninfectious is the first thing to determine when we diagnose a plant disease sample.

Environmental stresses and improper cultural practices that can lead to plant failure are numerous. They include too much or too little water, soil or water that is too salty, pH that is too high or low, use of excess fertilizers or nutrient deficiencies, or chemical injuries (from herbicides, pesticides, runoff or other pollutants). As a general rule, noninfectious disease symptoms are distributed evenly over a large area or over several different plant species. They may also be associated with some specific location(s) or cultural practice, such as where herbicide applications were prepared, or with some environmental events, such as frost or a hail storm. In contrast, infectious disease symptoms develop sporadically, are distributed unevenly, and usually are restricted to a particular plant species, or even cultivar. Therefore, field distribution of diseased plants and symptoms is an important initial observation for disease diagnosis. It is not possible for professional diagnosticians to examine spatial distribution of every disease sample received. Thus, you are in a better position to make these observations than diagnosticians are.

If a disease IS involved, the next question is, “What pathogen(s) is causing the problem?” There are at least ten thousand fungi, and hundreds of bacteria, viruses and nematodes that

could cause plant disease. To narrow this down requires some basic knowledge of morphology and biology of the individual groups of plant pathogens. At this stage, plant pathologists usually look for two things: disease *symptoms* and disease *signs*.

Disease symptoms are the changes in the plant from its normal appearance in response to the pathogen. Individual (groups of) pathogens may cause specific symptoms. For example, *mosaic* symptoms are usually associated with viral diseases. *Spots* and *lesions* are usually associated with fungal and bacterial diseases. Viruses rarely cause root rots or cankers (stem lesions). Thus, learning symptoms that tend to be associated with the different groups of pathogens is an important step toward correct diagnosis of plant disease problems.

Detecting disease signs may also be helpful at this stage. Disease signs are vegetative and/or reproductive structures of plant pathogens left on the plants or plant parts. Some fungi and bacteria grow on the surface of leaves, stems, petals, etc., where they may be seen. The most obvious examples are rusts and powdery mildews, which can often be identified with the naked eye from the massive amounts of spores or white fungal threads [Figure 6] on the plant surface.

Sometimes signs of fungal pathogens may be observed on diseased plant parts after placing them in a humid chamber for a day or two. A plastic bag with a moist paper towel works well for this. Some bacteria may be released from infected plant tissue where they may ooze visibly from wounds under wet conditions. Pathologists sometimes use this trait to test for bacterial disease in the lab by cutting a small piece of infected tissue and lacing it in a beaker with tap water. Bacteria in the plant tissue may ooze into the water, making it cloudy.

A similar procedure may be used to examine certain nematode diseases. Nematodes are large enough to be seen with a hand lens after they are released into water. Thus, disease symptoms and signs along with some preliminary observations can help narrow down the casual agent of many disease samples to specific pathogen groups.

Substantial additional examinations are needed to determine exactly what species causes a disease problem. Justification for this extra effort depends on disease management options. Further identification is justified only for fungal diseases in situations in which a fungicide(s) must be applied to keep the disease under control. There are several fungicides labeled for control of fungal diseases, but some are only effective in controlling a specific group of fungi.

There are two types of fungi: *true fungi*, and *oomycetes* (water molds), that cause plant diseases. These different groups of fungal pathogens have different physiologies, so fungicides that can effectively control diseases caused by true fungi may have no impact on those caused by oomycetes. Major oomycete pathogens include *Phytophthora* and *Pythium* species, which are primarily responsible for root rot of numerous plants. Also included are the species that cause downy mildews of many crops.

Consulting a professional diagnostician or sending a sample to a diagnostic lab is recommended when you are uncertain about which group of fungal pathogen is responsible for the plant problem. Detailed examinations may be useful for helping with cultural recommendations, or for fungicide recommendations if the services of a licensed pesticide applicator are utilized. However, there are few options for control of bacterial, nematode and viral diseases in the landscape. Thus, diagnosing which group of pathogen is

causing the problem is most likely all you need.

Basic diagnostic tools:

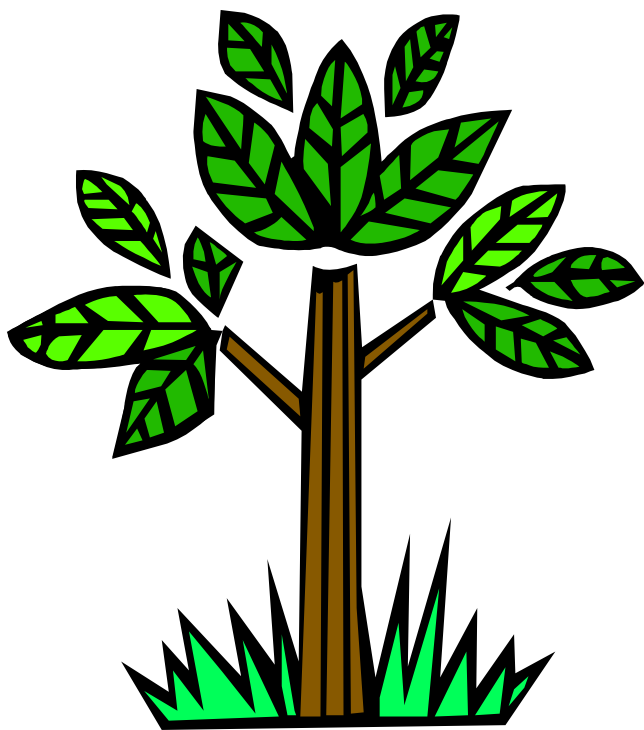
- Scissors or a sharp knife to collect samples and observe internal symptoms.
- A hand lens for observing pathogen structures.
- A small, clear glass of water to check for signs of bacteria.
- Clean sandwich bags, paper towels and rubber bands or twist ties for collecting and incubating samples.
- Some reference books. Several reference books are available for home use, but for detailed pathogen diagnosis, the most complete references are the disease Compendia published by the American Phytopathological Society (APS) Press. Individual compendia are available for specific crops or types of crops (e.g., stone fruits, cucurbits, turf grass, etc.). These compendia provide detailed descriptions of disease symptoms as well as descriptions of the pathogens causing the disease. The APS bookstore can be accessed at <http://www.shopapspress.org/>.

Step-by-step procedures:

- Identify the plant(s) involved.
- Inquire into site history of plant disease or other problems.
- Look for patterns of symptoms on plant parts or whole plants.
- Assess spatial distribution of disease symptoms in the landscape.
- Examine disease symptoms and disease signs using a hand lens when necessary.
- Compare disease symptoms and signs to the images in reference books and those posted on the Internet.
- Perform simple examinations for potential bacterial and nematode diseases with the aid of basic tools listed above.

- Consult with a local Extension agent, then a professional diagnostician, if necessary, or send a sample to a public or private diagnostic lab, depending on the nature of the diseases to be examined.

*Excerpted from Virginia Cooperative Extension
2002: Publication 450-800*



Pesticide News

2003 Pesticide Safety Education dates are announced on the web at::

<http://www.udel.edu/pesticide/Cal.htm>

September 30 & October 1 - Kent County Extension Office

December 18 & 19 - Kent County Extension Office

Insecticides:

AZADIRACTIN – As a result of the IR-4 Project manufacturers can now add to their label the usage on over 45 new ornamental species.

FLAGSHIP (thiamethoxam) – Syngenta – Registration is expected in the near future for use on greenhouse grown ornamentals.

FLORICAMID – FMC – A new systemic insecticide that should be registered the end of 2003 for use on greenhouse ornamentals.

PRE FERAL (*Paelomyces fumosoroseus*) – Biobest – This bio-insecticide has been introduced in Europe for ornamentals to control whiteflies. It currently is used on cucumbers and tomatoes.

PYLON (chlorfenapyr) – Olympia – As a result of the IR-4 Project they can now add to their label the usage on begonia, chrysanthemum, Transvaal daisy and vervain.

SCIMITAR (lambda-cyhalothrin) – Syngenta – The label for this product will be expanded for usage on indoor ornamentals.

TALUS (buprofezin) – Sepro – A new insect growth regulator that is expected to be registered this year on nursery crops and greenhouse crops.

ACARITOUCH (propyleneglycol monolaurate) - Toagosai Co. - Proposed to EPA to register this new active ingredient to control mites on a variety of food crops and ornamental plants. Comments must be received by 6-30-03. (FR Vol. 68, 5-30-03).

ACEPHATE 77 WP - United Industries - A new formulation for use on tobacco, peanuts, vegetables, cotton, ornamentals, turf and non crop areas.

DISTANCE (pyriproxyfen) - Valent - Added to their label the control of euonymous scale, fungus gnats, short flies and the suppression of mealy bugs.

F-1785 50WG (flonicamid) - FMC/ISK - Proposed to EPA to register this new active ingredient for use in ornamental nurseries and landscapes. (FR Vol. 68, 5-28-03).

STARKLE (dinotefuran) - Hokko chemical - Registration in the U.S. is expected in 2005, where it is being developed for use on cotton, vegetables, turf, ornamentals and as a public health insecticide.

TALUS (buprofezin) - Sepro - A new insect growth regulator that is expected to be registered this year on nursery crops and greenhouse crops.

Herbicides:

DRIVE (quinclorac) - BASF - Added to their label the control of English daisy, Carolina geranium, morning glory and wild violet in turf.

ECLIPSE (2,4,-DP/clopyralid/MCPA) - Riverdale - A new 3-way combination herbicide for usage on turf.

LASAR (oxyfluorfen/oxadiazon) - UHS - A new granular formulation for use on ornamentals.

ORYZA (oryzalin) - Ag Venture Inc. - A new formulation for pre-emergence weed control in fruit trees, nut crops and ornamentals.

PREPAAIR (napropamide/oxadiazon) - UHS - A new granular formulation for use on ornamentals.

REVOLVER (foramsulfuron) - Bayer - A new post emergence herbicide used to remove cool season grasses from warm season grasses on turf. It controls such grasses as poa annua, bluegrass, ryegrass and tall fescue. Also controlled are henbit and goosegrass.

SUREGUARD (flumioxazin) - Valent - A new formulation for pre and post emergence weed control in woody ornamentals.

VISTA (fluroxypyr) - Dow AgroSciences - A new herbicide being developed for post emergence usage on turf to control numerous hard to control broadleaf weeds.

Fungicides

CHIPCO 26-GT (iprodione) - Bayer - As a result of the IR-4 Project they can now add to their label the usage on African violet.

DECREE (fenhexamid) - Sepro - Label expansion will be the control of powdery mildew on ornamentals.

ECOGUARD BIOFUNGICIDE (Bacillus licheniformis (SB-3086/1BA) - Novozymes Biologicals - A new biological fungicide being developed to control dollar spot on golf courses and other turf grass areas.

FANATE (thiophanate-methyl) - Cerexagri - The company will introduce a 4.5 F formulation and a 70 WSB formulation of this fungicide for usage on turf and ornamentals.

PRESTOP (Gluocladium catenulatum strain J1446) - Verdena - As a result of the IR-4 Project they can now add to their label the usage on cedar, fir, hemlock and pansy.

PROSTAR 70 WP (flutolanil) - Bayer - Being developed for use on turf and ornamentals to control various diseases.

RHAPSODY (Bacillus subtilis (QRD-131) - Agra Quest - A new biological fungicide that should be registered in the near future on greenhouse ornamentals.

SEXTANT (iprodione) - Olympic - A new formulation available for use on ornamentals.

TERRACYTE (sodium carbonate peroxyhydrate) - Bio Safe Systems - A granular formulation applied to soil, potted plants, liners and turf to eradicate moss and algae, slime molds and liverwort.

Miscellaneous:

CURFEW (1,3-DCP) – Dow AgroSciences – Received a 24(c) label in SC for this liquid soil fumigant to use on turf to control nematodes.

PICCOLO (paclobutrazol) – Fine Agrochemical – A new formulation from Europe to be introduced into the U.S. market as growth regulator for use on ornamentals.

UNITED PHOSPHOROUS - The company has purchased the worldwide marketing rights to Surflan (oryzalin) herbicides from Dow AgroSciences.

Research Briefs

Propagation:

Sugar maple seedlings grow better under shade in the southern portion of the species range. Sugar maple seedlings are highly susceptible to solar radiation and water stress during the first few years of development. This study found improved height in bulked seed stock of sugar maple grown under shade was not a result of etiolation, but was better growth. (S.L. Clark and S.E. Schlarbaum)

Excerpted from HortScience, 38(2): 302-303. April 2003.

Container Production:

Mouse ear of river birch. In the past 5-10 years container nurseries have reported a disorder of river birch (particularly ‘Heritage’) produced in containers. This disorder results in small, cupped downward, dark leaves that look somewhat like the ears of a mouse, hence the name “mouse ear.” Researchers have determined that it is not caused by herbicide injury, macronutrients, or pathogens (i.e. fungi, bacteria, viruses or nematodes). They believe it is a physiological response to restricted root volumes in containers. After transplanting plants with mouse ear symptoms to 10 gal containers, the plants exhibited mouse ear symptoms on the new growth the following year but have started to outgrow the problem. (S.N. Jeffers, W.L. Bauerle and A. Melton)

Excerpted from SNA Newslines May/June, 2003.

Fall fertilizer on azaleas affects hardiness. Fall fertilization improves spring growth in many woody nursery crops. However, lack of research and fear of frost damage may be preventing proper fall fertilization. The purpose

of this research was to determine the effects of fall fertilization on cold hardiness and growth of *Rhododendron x Kurume* 'Hinodigiri.' A 125 ppm rate of fertilization applied in either late summer, or in both late summer and fall reduced evergreen azalea stem frost hardiness in November. In addition, higher fertility (125 ppm) through October and November continued to suppress frost hardening through December. In contrast, extending fertilization at 75 ppm N through October and November did not reduce fall or early winter frost hardiness. Nursery production using high rates of fertilization may reduce frost hardiness even if fertilization is terminated well before first frost. However, by maintaining a moderate fertility rate, nursery producers may be able to realize the benefit of fall fertilization (potential increased growth the next year) without any reductions in cold hardiness." (Henning, F., T. Smalley, O. Lindstrom and J. Ruter.)

Reprinted from GGIA Journal. Feb. 2003:39-40.

NOTE: Another beneficial side effect of maintaining adequate but not too high levels of N in evergreen azaleas over the winter is increased leaf retention and better foliage color in the spring sales season (Bir, R. E. and T. E. Bilderback. 1992. The affect of selected controlled release fertilizers on azalea leaf retention. Proc. SNA Res. Conf. 37: 60-64.).

Nursery floor affects containerized plant growth. Plants grown on the different floors required the same quantity of water to produce a gram of plant dry weight. Plants grown on ground cloth/black plastic (42%) and gravel (40%) had the highest N efficiency followed by black plastic (49%) and white plastic (43%). Plants grown on black plastic, ground cloth over black plastic, and gravel had similar canopy and substrate temperatures throughout the year. Plants grown on white plastic had significantly

higher canopy and substrate temperatures compared to all other nursery floors during the summer months. While the nursery floor affected canopy and substrate temperatures during the summer months, all of the nursery floors had similar canopy and substrate temperatures during late fall, winter, and spring months. This suggests that the nursery floor would not aid in winter protection. White plastic resulted in significant differences in plant growth, nutrient efficiencies, and canopy and substrate temperatures. Except for nutrient efficiencies, there were few differences in growth and water usage when plants were grown on gravel, black plastic or ground cloth/black plastic. Among black plastic, gravel, and ground cloth/black plastic, plants grown on gravel and ground cloth/black plastic had the highest N and P efficiency. (S.L. Warren and T. E. Bilderback)

Excerpted from VNLA Newsletter, May/June 2003.

Greenhouse Production:

Uniconazole effective as a medium spray for bedding plants. Uniconazole and other growth regulators are normally applied as a whole-plant spray or medium drench. In most commercial situations, applying growth regulators as a whole plant spray is easier and faster than applying a drench to the medium. However, uniconazole and other triazol growth regulators are very active through the medium and medium applicatiosn have fewer negative effects on flowering. This study found that a medium spray applied to the medium surface prior to planting bedding plant plugs had the same efficacy as a whole plant spray for petunia and coleus and had greater efficacy with impatiens and annual vinca . (J.E. Barrett, R.K. Schoellhorn, C.A. Bartuska, D.G. Clark and T.A. Nell)

*Excerpted from HortScience, 38(2): 169-172.
April 2003.*

Drought tolerance of marigold improved with phosphorus manipulation. Plants in soilless media are traditionally grown with excessive phosphorus levels. This study found that marigolds grown in soilless medium with a solid-phase phosphorus-buffer (alumina-buffered phosphorus at 21 μm) were more drought tolerant probably due to the following factors: smaller leaves that transpired more slowly; and longer roots with lower lateral root density, which increased root distribution within the container and improved water acquisition. (K. Borch, C. Miller, K.M. Brown, J.P. Lynch)

*Excerpted from HortScience, 38(2): 212-216.
April 2003.*

Captured irrigation runoff blended with rainwater can be an alternative water source for greenhouse crop production. Irrigation runoff water from a containerized landscape plant production bed was blended with rainwater from greenhouse roofs in a constructed collection basin and used to grow 18 foliage and 8 bedding plant species. Alkalinity, electrical conductivity, hardness and concentrations of nutrients of water from both sources were well within desired levels for greenhouse crop production. Turbidity and pH were relatively high from algal growth in the collection basin but all plants were of marketable sizes and salable quality independent of water source. No disease incidences or growth disorders related to water sources were observed. (J. Chen, R.C. Beeson, Jr., T.H. Yeager, R.H. Stamps, L.A. Felter)

*Excerpted from HortScience, 38(2): 228-233.
April 2003.*

Turf:

Seaweed extract, humic acid and propiconazole improve tall fescue sod heat tolerance and posttransplant quality. Sod frequently experiences severe environmental stress during the transportation, storage and transplanting stages of sale. This research suggests that foliar application of seaweed extract (SWE) and humic acid (HA), propiconazole alone, or in combination with SWE and HA may reduce shipment heat injury and improve post transplant rooting and quality of tall fescue sod. The treatments were applied over the foliage with a compressed-air boom sprayer delivering a water solution of the chemicals two weeks prior to harvest. (X. Zhang, E.H. Ervin and R.E. Schmidt).

*Excerpted from HortScience, 38(3): 440-443.
June 2003.*

Landscape:

Wildflower seedling tolerance to Plateau. Plateau caused only minimal stunting to annual phlox, and just slightly stunted lanceleaf coreopsis and sundial lupine. For these species, Plateau could be applied preemergent at 2-4 oz product per acre. Scarlet sage, blanketflower and black-eyed Susan were less tolerant (stunting and occasional stand thinning) so preemergent Plateau rates should not exceed 2 oz product per acre for these species and increased seeding rates (at least 20% greater) should be considered to compensate for possible stand thinning. (J.G. Norcinin, J.H. Aldrich and F.G. Martin)

*Excerpted from J. Environ. Hort. 21(2): 68-72.
June 2003.*

Irrigating landscape bedding plants with recycled nursery water. Drip irrigation of single pass recycled wetland effluent or direct

nursery runoff were suitable for drip irrigating zinnia, vinca, pansies, and snap dragons in landscape settings. These same treatments were effective for drip irrigating larkspur and paperwhite narcissus as cut flower crops, but reduced the yield of sunflowers during the warm season. If soluble salt levels increased to the 3.0dS/m level, then salts will need to be diluted with less saline water. (M.A. Arnold, B.J. Lesikar, G.V. McDonald, D.L. Bryan and A. Gross)

Excerpted from J. Environ. Hort. 21(2): 89-98. June 2003.

Insect Control:

Talstar 0.2G or Talstar F controls white grubs and black vine weevil larvae. This insecticide has a half-life of at least 3 years irrespective of medium composition. Data suggest that >95% larval mortality of these scarab species can be expected up to three years following treatment of media with 10 ppm bifenthrin (Talstar) and >99.9% mortality is expected for at least three years following treatment of media with 20 ppm bifenthrin. (R.S.Cowles)

Excerpted from J. Environ. Hort. 21(2): 78-81. June 2003.

New Releases:

‘Sun Valley’ Red Maple. Released by the U.S.D.A., ‘Sun Valley’ has a symmetrical, broadly columnar crown with strong, upright branching. Autumn color peaks as a red with most leaves gradually maturing to a red purple. Fall color usually persists about 2 weeks. ‘Sun Valley’ is hardy from Zones 4-8a. ‘Sun Valley’ red maple offers a unique combination of insect tolerance, outstanding and consistent autumn color, symmetrical growth form and adaptation to a wide variety of environmental conditions.

The U.S. National Arboretum, Agricultural Research Service, and U.S.D.A. released this cultivar to wholesale nurserymen in 1995. The U.S. National Arboretum does not have stock of these plants available for general distribution but it is available from a variety of nursery sources.

Excerpted from J. Environ. Hort. 21(2): 108-109. June 2003.

Marketing:

Some herbaceous perennials could be marketed as indoor flowering potted plants. Customers generally perceive indoor flowering potted plants as short-lived and inappropriate for outdoor planting. Perennials are perceived as outdoor plants. Producers have learned to force perennials into bloom for use as indoor flowering potted plants, which may provide a new product to stimulate sales of this lagging floral category. Based on consumer surveys at a Michigan flower show, *Campanula* and *Oxalis* have the greatest potential to be positioned for dual indoor and outdoor use. (B.K. Behe, E.H. Moore, A. Cameron and F.S. Carter)

Excerpted from HortScience, 38(3): 460-464. June 2003.

Calendar

September 8 – Ornamentals Short Course Plant Stress Management, 6-8 PM, Kent County Extension Office.

September 10 – HRAREC Field Day, Virginia Beach, VA. Contact: (757)363-3900, bapple@vt.edu

September 13 – Invasive Plants Conference Backyard Invaders: Plants In and Out of the Garden. Registration at 8:30am. Certified Nursery Professional, the International Society of Arboriculture and the Delaware Dept. of Agriculture for the pesticide applicators license. To receive a brochure and registration form or to sign up for the conference, call Amy Foster at (302)658-6262, ext. 36. Conference registration fee is \$35, includes lunch.

September 16 – Ornamentals Research Expo, 5-8 PM, UDBG

September 17 – Interior Landscaping Nite, 5pm, Eastern Center for Arts & Technology, Willow Grove. Contact: Warren Goll, (610)690-7676.

September 17 – Landscape Updates – 1-4pm, Middletown Township Auditorium (Bucks County). Contact: Scott Guiser, (215)345-3283.

September 17 – Landscape Updates – 4-9pm, Schnecksville Fire Company Pavilion. Contact: Emelie Swackhamer, (610)391-9840. Field day contact: Bill Berkheimer, (610)871-0281.

September 19 – New England Invasive Plant Summit, hosted by the New England Wild Flower Society, Framingham, Massachusetts. Register online at www.newfs.org. For information, contact cmattrick@newfs.org or call (508)877-7630 ext, 3204.

September 20 – 10th Annual Tree Spree Fair and Pike Creek Community Day – Location: Carousel Park on Limestone Road in northern New Castle County – time 10am – 3pm.. For more information call: Vikram Krishnamurthy, DCH Tree Program Manager (302)658-6262, ext. 33. Event is free and open to the public.

September 21- ANLA Legislative Conference, Washington, DC, Contact: (202)789-2900, www.anla.org

September 22 – Ornamentals Short Course Pruning Workshop, 4-6 PM, UDBG

September 24 – Landscape Update – 1-4pm., Montgomery County 4-H Center, Creamery, PA. Contact: Mary Conclkin, (610)489-4315.

September 25 – 9am – 12 noon, Delaware County Cooperative Extension. Contact: Nancy Bosold, (610)378-1327 or Mary Cocklin, (610)489-4315.

September 30 – Ornamentals Short Course – Urban Wildlife Control, 6-9 PM, Kent County Extension Office.

September 30 & October 1 – Pesticide Safety Training Kent – County Extension Office

October 2 & 3 – 13th Annual Perennial Plant Symposium, “Nurturing Nature,” hosted by the School of the Chicago Botanic Garden in Glencoe IL. Speakers include: Rich Darke, Kurt Bluemel, Clair Kettlecamp, Bobbie Schwartz, and Sheila Brady. For information, call: (847)835-8261 or visit www.chicagobotanic.org/symposia.

October 1-5 – ANLA Retail Road Show, Northern California

October 7 – Ornamentals Short Course – Groundcovers, 6-9 PM, Kent County Extension Office.

October 9 – Ornamentals Short Course – PDA Training, 6-9 PM, New Castle County Extension Office.

October 13, 14, 15, 16 & 17 – Ridley Creek State Park, Media, PA. Contact: Cheryl Bjornson (610)696-3500. Pre-registration is required.

October 14 & 16 – Ornamentals Short Course – Integrated Landscape Management, 4-6 PM, New Castle County Extension Office

October 15 – Ornamentals Short Course- Ornamental Grasses, 6-8 PM, Kent County Extension Office.

October 27, 28, 29, 30, 31 – Horticulture Short Course, Montgomery County 4-H Center, Creamery, PA. Contact: Mary Concklin (610)489-4315.

November 13 – Ornamentals and Turf Workshop, Hockessin Memorial Hallo, Hockessin, DE Contact Valann Budischak, phone: (888)448-1203.

December 18 & 19 – Pesticide Safety Training – Kent County Extension Office.

