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Editor: Susan Barton, Extension Specialist, University of Delaware
 The DNLA Newsletter is produced with the assistance of University of Delaware Cooperative Extension.

FROM THE PRESIDENT
Wendy Wrede Rezac
Delaware Nursery and Landscape
Association

WOW!!!! What an absolutely crazy spring. When Valann called to tell me it was time for another newsletter, my initial thought was where am I going to fit that into my already long list of things to do. Here in Dover we haven't had a 'rainy day' to do a little catch-up work since early May. Well, low and behold when I woke up this morning (June 5) it was very nasty and rainy so I thought I would take a few minutes to say hello.

I hope everyone is having as good a season as we are at the garden center. Lack of rain in Dover has not stopped people from planting and working in their yards. One of our biggest problems this spring has been trying to restock products as we sell out of them. Annual growers were selling out of many items really early and deliveries for hard goods, such as bagged materials, were backed up for weeks. Now I'm not complaining – just commenting. I welcome being sold-out versus the alternative of sitting on product due to bad weather.

I hope the rain we are receiving this weekend (probably because it is Race weekend) is enough to help the farmers and those in the lawn maintenance business. Things sure had gotten dry in Kent and Sussex counties. Irrigation systems seemed to be going all the time.

Well, I just wanted to say a quick hello. I must move on to my pile of 'rainy day' work. Hope to see everyone at the Summer Turf and Nursery Expo.



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

Greetings to all!! Summer has arrived. Mother Nature has been kind to those located north of the C&D canal. She has not been as kind to those in Kent and Sussex Counties. However, no matter where you are located, the word is that people seem to be contracting the services of our members, and purchasing plants and other gardening and lawn care products with a vengeance.

The D.N.L.A. is busy gearing up for our annual Summer Turf and Nursery Expo and Golf Tournament that will be held on Wednesday, August 18th at Jonathan's Landing Golf Club. As always, we will have the opportunity to visit with exhibitors and friends, hear from some outstanding speakers, obtain a pesticide credit, and indulge ourselves with the delicious pig roast. This year Paul Cimini (E.P. Henry) will show us the art of step construction using segmental wall materials. Don Knezick and Dan Segal of Pinelands Nursery & Supply will show us the latest in native plants and products available for erosion control and stormwater management. Last, but far from least, the ever-popular Bob Mulrooney will challenge us with a plant pest and disease problem solving workshop. Registration forms are forthcoming. Please join us for this fun-filled day!

Remember to keep the Landscape Awards in mind throughout the summer. Applications will be mailed in the beginning of September. We encourage any/every member to submit an entry!

On a more somber note, the DNLA would like to express their deepest sympathy to the family of Roy Reichold of Milford, Delaware. Roy, a DNLA Hall of Fame member and former owner of Dannegar's Nursery, died on June 8th.

U of D NEWS

Susan Barton, Extension Specialist

Summer and Fall offerings in the Ornamentals Short Course program include:

Good Underused Plants for Delaware

Landscapes – Dr. John Frett, UDBG, June 24, 5-7 PM

Landscape Design for Delaware

– Susan Barton, Research and Education Center, July 13, 6:30-8:30 PM

Troubleshooting Landscape Problems

– Bob Mulrooney, New Castle County Extension Office, July 15, 6:30 -8:30 PM

Pruning Workshop

- Jo Mercer, New Castle County Extension Office, July 27, 6:30-8:30 PM

Troubleshooting Landscape Problems

– Bob Mulrooney, Research and Education Center

Fertilizing Greenhouse and Nursery Crops

– Gordon Johnson and Jay Windsor, Research and Education Center, September 28, 7-9 PM

Landscape Design for Delaware

– Susan Barton, Kent County Extension Office, October 19, 7-9 PM

Look for **Managing New Construction Sites** and **Landscape Drainage** workshops to be held in Kent County at a soon to be announced date and time this fall.

On March 16th, seven individuals sat for the Certified Nursery Professional core and/or specialty exams. Congratulations are in order for the following individuals:

NEW CNP's:

Chris Clay

Ronny's Garden World

Nursery Production Specialist

Josh Harrison

1st Impression, Inc.

Garden Center Specialist

Landscape Specialist

Kirsten Buhls

Sposato Landscape Co.

Landscape Specialist

NEW SPECIALTIES ADDED:

Don Stump

Barton's Landscaping/Lawn Co.

Landscape Specialist

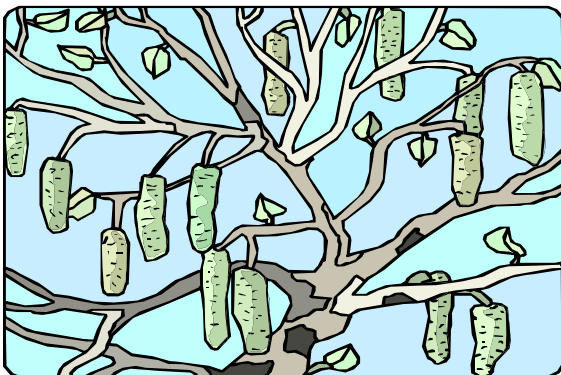
WELCOME NEW MEMBER:

Syngenta Crop Protection

538 Buckeye Lane

West Chester, PA 19382

(772) 713-9032





***ILEX INTERMEDIA* – A SPECIES NEW TO CULTIVATION?**

**Dr. John M. Ruter, Professor
University of Georgia**

Plants for a Livable Delaware began with a bang this spring. We received good coverage in the News Journal before supplies were actually printed and distributed to the three pilot garden centers (NCC – Gateway Garden Center; KC – All Seasons Nursery and Garden Center and SC – Lord’s Landscaping and Nursery). Each garden center had inquiries from customers about the program and we hurried to get them stocked with brochures, signs and plant tags. The first 10,000 brochures have been distributed by garden centers, state parks, state agencies, master gardeners and at several industry and homeowner events this spring and early summer.

Plants for a Livable Delaware is designed to identify and promote superior plants that thrive without becoming invasive. A Livable Delaware plant must

- Possess adaptable characteristics to landscape situations (i.e. drought resistant, tolerant of poor soils, etc.)
- Pose no potential threat as an invasive plant
- Have no serious disease or insect problems
- Be hardy to Delaware

Since I first saw the magnificent specimens of *Ilex purpurea* growing at the Bamboo Farm and Coastal Gardens in Savannah, Georgia in 1990 I have been enamored with the species. Over the years I have tried to acquire hardier germplasm of this species since the plants growing in Savannah are from South China and have been damaged by cold winters in the past. In 1991 Camellia Forest Nursery in Chapel Hill, North Carolina listed seedlings of *I. purpurea* from a recent collecting trip to southwestern China as being available, so I ordered one and planted it in my field evaluation plots in Tifton in the spring of 1992 .

After several years I began to notice that the plant superficially appeared similar to *I. purpurea* but did not have the vigorous growth of the species. When the plant flowered for the first time in 2000 it was obvious that the plant was not *I. purpurea*, but a species more closely aligned with *I. buergeri*. Not knowing the name of a holly gets under my skin so during this past winter I contacted David Parks at Camellia Forest Nursery to see if he had any further information on the species and I also sent dried flowering and fruiting specimens to Susyn Andrews, formerly at The Royal Botanical Gardens, Kew to see if she could help with identification.

David provided me with the following information. He indicated that the species had been collected on Daweishan Mountain, Liuyang County, Hunan Province in 1990 (Longitude 114.0E, Latitude 28.5N0. The height of the mountain is approximately 1300 m (4360 ft) and is located on the border between Hunan and Jiangxi Provinces. Other species

growing with this holly were *Phyllostachys pubescens*, *Sassafras tsumu*, *Cunninghamia*, *Cryptomeria*, *Castanopsis sclerophylla*, *Liquidambar acalycina*, *Cyclocarya paliurus*, *Torreya*, *Acer*, *Camellia oleifera*, *Rhododendron*, and *Liriodendron chinense*.

David noted that he has several seedlings of this species in his gardens but agreed with me that they are no *I. purpurea*. I had a chance to visit with David and his father Clifford Parks at the American Camellia Society meeting in Savannah this past March and Cliff told me that the seed had been collected by one of his graduate students and was called *I. purpurea* based on what the student had been told by local botanists.

Susyn Andrews has identified the plant as *Ilex intermedia* Loes. To her knowledge, this is the first time this taxon has been in cultivation. Shui-Ying Huy gives a description of the plant in the Journal of the Arnold Arboretum (1950, 31:78-79). She lists the plant in subsection *Repandae*. It is described as an evergreen tree being endemic to the area from which the genus *Metasequoia* was found. It was first described in 1900 and herbarium specimens exist from such famous plant collectors as A. Henry, E.H. Wilson, and R.P. Farges.

My one plant in Tifton was approximately 4' tall after five years in the ground. After 10 years the plant was 6.2' in height with a spread of 6.6'. By comparison, a male selection of *I. purpurea* growing nearby was over 25' in height after the same period of time. From seed collected in spring of 2002, four seedlings have germinated. No fruit was produced during the 2003 season. In our sandy soils the plant responds to adequate fertilization (100 lbs. N/A/yr.) with improved foliar color.

Reprinted from Landscape Plant News, Volume 15, No. 1, 2004.

NATIVE MAPLE: MOOSEWOOD

Peter Podaras

Landscape Plant Development Center Plant Breeder, Cornell University

Maples are one of the most widely recognizable trees in our landscape. Roughly 90 species are hardy in New England but the most frequently planted species are red maple (*Acer rubrum*), freeman maple (*A. x freemanii*), sugar maple (*A. saccharum*), Norway maple (*A. platanoides*) and silver maple (*A. saccharinum*). These species tend to be very large shade or street trees but there are also smaller ornamentals.

The smaller ornamental tree appeals to the homeowner with a limited space or who simply wants a smaller tree for his or her garden. Japanese maples such as *Acer palmatum*, *A. japonicum* and *A. shirasawanum* are known for their diverse leaf forms and fill this niche well. The trifoliolate maples, paper bark maple (*A. griseum*) and three flowered maple (*A. triflorum*), are known for their beautifully colored peeling bark. However, the striped maple, with its smooth green and white striped bark, is often overlooked.

There are 14 species of striped maple worldwide; all small trees or large multiple stemmed shrubs. Almost all are found in Asia but one of the most beautiful of all these small trees, *A. pensylvanicum*, is native to eastern North America. Its range starts in northern Georgia, through the Appalachians to Nova Scotia and west to Wisconsin.

Sometimes called moosewood or goosefoot, *A. pensylvanicum* is most frequently found growing in cool, moist, shady, north-facing slopes. In Canada, Vermont, Maine and New Hampshire it is more widespread, growing in mesic forest under the shade of other trees. The soil it grows in is frequently acidic and some

sources claim that this tree will decline in higher pH soils. The root system is very shallow and wide-spreading, making it well able to compete with much larger species of trees for water and nutrients. What makes this tree so ornamental is the beautiful smooth green bark with distinctive white vertical stripes. The green and white contrast seems to intensify during the winter. The autumn leaf color is always a very clear, bright golden yellow.

There are several cultivars but only one has been propagated to any extent. *A. pensylvanicum* 'Erythrocladum' possibly has the most stunning red colored bark of any small tree. Discovered in Germany in 1904, 'Erythrocladum' received the Royal Horticultural Societies Award of Merit in 1976 and the First Class Certificate in 1977. Due to difficulties in propagation, it is rare in cultivation.

'Erythrocladum' will grow to 20 feet with a spread of 10 to 12 feet. It tends to be more columnar than the species, which can be 15 to 20 feet wide. Plant it in part shade or shade- no sun – in moist, cool soil. Don't allow the soil to dry out. After four or five years, it should be more drought tolerant.

Like the species, this tree has striped bark but instead of green its bark is dark yellow in summer that changes to a bright red in winter. This color is hard to beat in the winter garden and does not diminish with age. *A. palmatum* 'Sangu Kaku' comes close but only its younger twigs show any color. Placing 'Erythrocladum' in front of a dark background really brings out the color. Depending on how cold it is outside, it will be hard to tear yourself away from this gorgeous plant in the winter!

Reprinted from Landscape Plant News, Volume 15, No. 1, 2004 (originally published in The Connecticut Gardener, September, 2002, vol. 8,

no. 4)

DAYLILY RUST – AN AVOIDABLE NUISANCE

Since its discovery in 2000, daylily rust (*Puccinia hemerocallidis*) has been found in daylilies in over half of the United States. The infection does not kill daylilies and, according to the All-American Daylily Selection Council (AADSC), can be avoided by proper selection and horticultural practices. In a worst case scenario, daylily rust can be controlled by treatment of the susceptible varieties.

Daylilies infected by *Puccinia hemerocallidis* show unsightly rust spots and yellowing, mainly on older foliage, similar to rust symptoms on roses, geraniums and other garden plants. The rust is confined to the foliage and bloomstalks (scapes) and does not enter the crown or roots. No daylily plants have been killed by the rust. *Puccinia* spores spread quickly by wind, on clothing and infected plants, but do not infect other plant species. Roses have their own specific rust species, as do most other ornamental plants. Just as with roses, symptoms of daylily rust vary greatly depending on growing conditions and the susceptibility of each variety. Among the 48,000-plus daylily cultivars are varieties that are unusable in some gardens and those that are virtually symptom-free.

The worst rust symptoms will appear on daylilies grown in conditions of high humidity, poor air circulation and nighttime overhead watering. Daylily rust spores require 100% humidity and temperatures between 40 and 90 degrees for five to six hours to germinate. If germination does not occur within two to three days, the spore dies. If germination occurs, infection can lie dormant within green tissue until optimal conditions arise. It appears that spores do not survive outdoors in winters colder than USDA Zone 6, making daylily rust less of a

problem in colder areas.

Since 1989, the AADSC has operated a network of daylily test sites throughout the United States and has collected data on over 50 performance characteristics. In 2001, rust resistance was added as one of the key test criteria. In selecting for “bulletproof” performance, the AADSC has eliminated many of the highly susceptible varieties from its program and focused on identifying and promoting the most rust-resistant daylily varieties. The AADSC does not release conclusions about varieties until it has three to five years worth of testing information. In the beginning the AADSC simply rated cultivars as “more susceptible” or “less susceptible.” At present there are four scoring systems that the AADSC is aware of:

AADSC (multi-year, outdoor field tests) and University of Georgia (greenhouse, two test cycles of 4 weeks each)

S = Susceptible
MS = moderately susceptible
MR = moderately resistant
R = resistant

Cornell University Plant Disease Diagnostic Clinic

VS = very susceptible
MS = moderately susceptible
VR = very resistant

USDA National Plant Board

HS = highly susceptible
MS = moderately susceptible
LS = least susceptible

More than 700 varieties have been or are being put through rust trials by the AADSC and University of Georgia, as well as Cornell University and the USDA. Here are the results

on some of the most commonly available varieties:

Susceptible: Pardon Me
Ming Toy
Russian Rhapsody
Always Afternoon
Mary Todd
Pandora’s Box
Strawberry Candy

Resistant: Little Business
Mini Pearl
Butterscotch Ruffles

Among the AADSC’s “All-American Daylilies,” Black-Eyed Stella, Lullaby Baby, Bitsy, Frankly Scarlet, and Plum Perfect have been reported as rust resistant; Judith as moderately resistant; Star Struck as moderately susceptible; and Leebea Orange Crush as susceptible.

There are reasons that daylilies are America’s favorite perennial. They are an amazing plant, available in a rainbow of colors, shapes, sizes, and varieties that can be easily grown anywhere in the U.S. With proper selection, there’s no reason for gardeners to be intimidated by the rust challenge. For regularly-updated information regarding the benefits of gardening with daylilies, and comparisons of daylily variety performance (including rust resistance), visit www.daylilyresearch.org

For more information on All American Daylily Selection Council, please contact: Mary McLoughlin at (616)698-0748, P.O. Box 210 e 31606 East Pink Hill Road, Grain Valley, MO 64029

Reprinted from VNLA Newsletter, March/April 2004.

NEW WEED MANAGEMENT TOOLS FOR NURSERY PRODUCERS

**Jeffrey Derr
Virginia Tech**

A new herbicide, flumioxazin, was recently registered for use in container and field nursery production. Some of you have heard me discuss this herbicide at winter meetings across Virginia. The herbicide, marketed by Valent, is sold in granular form under the trade name SureGuard as a water-dispersible granular that is mixed with water and sprayed. The primary use will be in woody nursery crops. This herbicide should not be applied to bedding plants. Most herbaceous perennials will be injured by this herbicide.

Flumioxazin has the same mode of action as oxyfluorfen (Goal) and shares a lot of the same use patterns as oxyfluorfen, but is used at lower rates. Both herbicides control weeds preemergence with early postemergence activity. Conifers generally have excellent tolerance to both herbicides, especially if applied when dormant. Neither herbicide can be applied overtop actively-growing trees or shrubs so directed sprays or dormant applications are utilized.

The strength of flumioxazin is preemergence control of annual broadleaf weeds. The chemical has contact postemergence action so it will control small annual weeds. The postemergence action is not sufficient in most field situations containing emerged weeds, especially perennial ones, so a postemergence herbicide, such as glyphosate, can be added. Flumioxazin is less effective on annual grasses. Under low annual grass pressure, control of grasses like large crabgrass and yellow foxtail may be acceptable. At lower use rates, or under

high populations of annual grasses, a preemergence grass herbicide could be added for improved annual grass control. This herbicide will not control perennial weeds like yellow nutsedge or bermudagrass.

Flumioxazin is a contact herbicide that does not affect root development. The primary injury symptom from the granular form (BroadStar) is spotting of leaves where the granule stuck to crop foliage. Since this compound has only contact action, the injury will not spread to other parts of the plant and leaves developing after application will be unaffected. Therefore it is important to apply BroadStar to dry foliage, followed by irrigation to wash the granules off nursery crop leaves. Do not apply BroadStar to species that catch and funnel granules to the crop stem as this herbicide can burn tender stems and leaves. Injury symptoms from SureGuard include spotting and burning of foliage, especially young leaves, and tip burn in sensitive species.

BroadStar will be the preferred formulation for container use due to two reasons. First, most growers are geared up to apply granular forms instead of sprays in container production. Second, since the herbicide has contact action, the granular form is much safer on broadleaf nursery crops. One good example is azalea, which can be severely injured if sprayed overtop with SureGuard but possess good tolerance to the granular form. BroadStar can be applied to a wide range of trees and shrubs, while use of the sprayable form SureGuard will be limited to conifers and deciduous trees.

There is only one application rate for BroadStar, which is 150 pounds per acre. Since BroadStar contains 0.25% active ingredient, this translates to an application rate of 0.38 pounds of flumioxazin per acre. This is significantly lower than the rates of oxyfluorfen that are applied, which ranges from 0.5 to 2.0 pounds active

ingredient per acre.

In my container trials, BroadStar has provided good to excellent control of common groundsel, creeping woodsorrel (*Oxalis*) from seed, spotted (prostrate) spurge, doveweed, longstalk phyllanthus, chamberbitter, mulberry weed, and doveweed. BroadStar has provided good control of eclipt, and sowthistle with fair to good control of large crabgrass, flexuous and hairy bittercress, horseweed, and common chickweed. The control of annual bluegrass, a winter annual, has been poor to fair.

Suggestions for Container use of BroadStar

- Dormant applications preferred
- Apply to dry foliage and irrigate granules off
- Reapply 8 to 12 weeks later
- Do not apply to herbaceous ornamentals or to plants that catch/funnel granules to stem base

SureGuard will be used predominantly in field production of conifers and deciduous trees, although it does have a fit in container-grown arborvitae, pine, juniper, spruce, fir, yew and hemlock. It can be applied overtop dormant conifers, or applied after new growth has hardened off. Applications to deciduous trees ideally should be made prior to budbreak in the spring or in fall. Apply to deciduous trees as a directed spray and do not allow spray to contact breaking buds desired foliage, or green stems.

In my field trials, SureGuard has provided excellent preemergence control of common lambsquarters, pigweed, velvetleaf, jimsonweed, common ragweed, prickly sida, and hairy bittercress. It has also controlled some perennials from seed, such as buckhorn plantain and yellow woodsorrel. A postemergence herbicide, however, would need to be added to

control existing plants of these species.

I have observed good preemergence control of annual morningglory species (ivyleaf, pitted, and tall morningglory) and cocklebur. The annual grass control (large crabgrass, yellow foxtail, giant foxtail) has been fair to excellent, depending upon rate and trial. The control of johnsongrass from seed was fair. The application rates for SureGuard range from 8 to 12 ounces or product per acre, which equates to 0.25 to 0.38 pounds active ingredient per acre.

Suggestions for Field use of SureGuard

- Dormant applications preferred
- Treat in early spring and fall
- Could add a preemergence grass herbicide, especially under high annual grass pressure or lower SureGuard rates
- Add a postemergence herbicide for control of emerged weeds
- Use directed sprays, do not apply overtop of broadleaf trees

Another important use of SureGuard will be non-crop weed control around the nursery. It can be used to control weeds in gravel roadways, along fences, around buildings and other areas to maintain bare ground areas weed-free. This is especially important for control of weeds like common groundsel, sowthistle, and horseweed, whose seed can blow into production areas from noncrop areas around the nursery.

Reprinted from VNLA Newsletter, March/April 2004.

PRESS RELEASES - DO IT RIGHT!

Many potential clients will call me and say, “I need someone to write a couple of press releases for me,” believing that writing and sending out a press release means automatic news coverage. I must then explain to the prospect that he/she would be wasting their money. A press release is only as good as the issue itself, the angle taken on the issue, the selection of media on the receiving end, and the follow-up. Without any one of these elements, the press release doesn’t do much good.

I have had clients that thought posting a press release on a newswire service was all they needed to do. Even the newswire postings need follow-ups. Some potential clients feel that sending out a lot of press releases amount to good media relations practice. In fact, it could be argued that just the opposite is true. The fewer releases sent out the more value the news item is likely to be. In my reporter days, I would automatically toss a release from an organization that kept sending them to me. Keep in mind that reporters and assignment editors receive dozens of releases per day in many markets.

Some media relations professionals will tell you that following up a press release with a reporter is not a good idea because reporters are busy people with several deadlines. My experience is that following up is a must! If you are selective about your news value and media list, many reporters will be genuinely appreciative of your follow-up if it involves an issue that interests them.

The best press releases:

- cover a worthwhile issue.
- contain a logical angle that benefits the audience.
- are sent to a carefully-selected group of

media outlets.

- are followed-up in a timely, brief manner.
- are not sent too often.

Don't forget the Follow-up!

You have your spokesperson ready and your press release is quickly running through the fax machine and e-mail outbox. You're about to see whether all of that hard work will pay off with reporters knocking down your door

“Somewhere along the line, perhaps at a gathering of public relations pros, someone has told you not to bother following up those press releases. “If they are interested in your story, they will call you,” was the wise word. Some reporters' answering machines even say the same thing. You normally hear that from a network or large market reporter. That's because their phones ring off the wall with non-stories. But in most cases, it is a good idea to follow-up. Personal contact is always better than a sheet of paper! That means personal visits to a newsroom is the ideal way to make a media contact, but that is not practical for follow-up purposes, unless there is good reason for a media tour. Phone calls are the next best thing. Normally, reporters like to be reminded about good stories because they may have filed your press release away. You may also have new information to give them that was not in the press release. However, there are rules to follow when calling a reporter.

Remember that reporters have a lot of deadlines. Some must get stories on the noon, 5:00, 5:30, 6:00 and even 10:00 or 11:00 evening newscasts. That means editing several different angles of the same story. A lot of pressure indeed! That means your follow-up needs to get their attention. You won't normally get much response if you call within two hours of their newscast. Also note that reporters have morning meetings with their news director, executive producer, show producers and

assignment editor at about 8:30 – 9:00 am (2:30 – 3:00 pm for the night reporters). The purpose of these meetings is to determine what stories get covered. That means the best time to call a reporter is before the meeting, to make sure they received your release and to give them a good story idea to present at the meeting. As an alternative, it is not a bad idea to call the reporter after the meeting, between 9:30 and 10:00 am, but they may already have their story for that day. Also consider calling the assignment editor at a television station or news editor at a newspaper if the reporter is not available.

In the hectic world of a newsroom, follow-ups can be the determining factor between your story idea being broadcast and landing in the circular file.

Good Follow-up

- Avoid reporter deadline times when following-up.
- Follow-up before or just after the reporter's morning meetings.
- Keep in mind that the reporter receives a lot of press releases.
- Consider calling the assignment editor or news editor.
- Remember that personal contact works best!

It's a Visual Medium!

Before you send your press release or make that media pitch, ask yourself what you really have to offer the reporter. Your story idea is valid. So is your angle. You've even lined up someone for the reporter to interview. But something is missing. Video!

In many cases the news outlet will want to get its own video. However, if you have an item that is hard to come by, such as a medical procedure, you can supply the video to the reporters. The video you send reporters should

be on a Beta SP tape, because that is broadcast quality. For my clients, I have also made video available through their web sites for reporters and editors to download. It has been well worth the investment. If you have a good quality video on a VHS tape, it can be dubbed (copied) to Beta SP (if a dubbed video is acceptable to the television station--make one copy, send it to the station and get their opinion). If the quality is not good enough, it is a sound investment to hire a video crew to shoot some stock footage.

For small community newspapers, your supplying the photos can make the difference in getting a story published. Large metropolitan newspapers normally do their own photography. If you are going to supply photos, a digital camera and e-mail make it convenient! As in television, make sure your quality is up to the publication's standards. You will also need to provide to the newspaper the names of those in the photos. Reporters will appreciate your supplying the visuals, because it is one less thing for them to be concerned about. With television reporters, no video means no story! If you are not able to supply video, think of some visual ideas for the reporters. Remember that reporters don't like video of buildings, signs, or meetings.

Supply Good Video:

- Video format should be Beta SP.
- Make your video available on the web.
- Use digital cameras and e-mail or photos.
- Make sure your quality meets the standards of the media outlet.
- If you can't supply the video, suggest some ideas to the reporter

Courtesy of Al Rothstein Media Services, Inc.
<http://www.rothsteinmedia.com>
e-mail: meiabrain@rothsteinmedia.com
toll free: (800)453-6352

WHAT'S IN THE BOTTLE? OVER-THE-COUNTER INSECTICIDES & MITICIDES

David J. Shetlar
The Ohio State University

Over the last several years, as USEPA continues to review organo-phosphate and carbamate insecticides under the guidelines of the Food Quality Protection Act, most of our traditional insecticides and miticides have been "not supported" by manufacturers, "voluntarily" withdrawn from residential use, or other major restrictions have been imposed on their usage. As the traditional materials disappear, most of the manufacturers and distributors of over-the-counter, non-restricted use products have changed active ingredients in their products yet many have retained the original names – part of the cost of brand name recognition!

Because of these active ingredient changes, many of which may not be familiar to garden center employees or others who provide advice to the general populace, I have decided to try and provide a guideline of some of the new active ingredients. I will also provide a listing as to whether these new compounds will perform adequately for specific pest groups. The reason for this is that US-EPA does not require efficacy data for active ingredients. Their thinking is that "customers will determine the market value of products." An interesting concept, but during the "determination" phase, many people will pay hard earned dollars for products that may not control the pests! In fact, I'm seeing some active ingredient switches in name brand products, yet the label's list of pests remains unchanged. In order to not get sued, I will try to keep mentioning of brand names to a minimum and try to concentrate on the active ingredients. I know that this will be difficult for

some of you, since no one likes to really read labels!

What's being lost?

The major over-the-counter products, chlorpyrifos (=Dursban), diazinon, and acephate (=Orthene) have been dropped or are in the process of being dropped. The "stop sale" date for chlorpyrifos-containing products was December 31, 2001, though a survey in Ohio garden centers in the summer of 2002 revealed that several stores still had such products on the shelf. In short, it is illegal to sell these products and they should have been returned to the manufacturer or distributor. Diazinon-containing products can be sold until December 31, 2004 (the "stop sale" date), though the "stop distribution" date is at the end of 2003. After the stop sale date, any remaining products will again have to be returned to the manufacturer. Acephate-containing products were voluntarily withdrawn and I haven't seen a "stop sale" date yet. However, since the Ortho products were the main ones containing acephate, most of these have been sold off the shelves and the new Ortho products have substitute ingredients.

Two of my favorite systemic insecticides, dimethoate (=Cygon) and disulfoton (=Di Syston, and 2-in 1 Rose Systemic Granules) are also being voluntarily withdrawn and existing products can be sold out. While both of these insecticides/miticides were moderately toxic, they were being provided in lower concentrations and they were some of the truly translocated systemics that were available to the home gardener. Both did an excellent job on some of the tough-to-control pests – leafminers, borers and scales.

Carbaryl (=Sevin) is also coming under heavy pressure during the EPA review that was posted in 2002, and it looks like it will go down the

same path as the rest – restricted from residential use, but conserved for agriculture.

For miticides, we lost docofol (=Kelthane) many years ago from over-the-counter use and oxythioquinox (=Morestan) was never really available to homeowners. When I visited garden centers, most recommended Orthene for spider mite control, though there is little evidence that topically applied acephate was ever a good miticide! Frankly, the best miticide for home gardeners to use is still horticultural oils and insecticidal/miticidal soaps.

Probably the most disturbing news that I received this last November is that EPA is expecting to finish its reviews of organophosphate and carbamate insecticides by 2004 and they are then planning a review of pyrethroids! Of course, these are the very insecticides that have been substituted! Stay turned for another round of changes in a couple of years.

Pyrethroids – the Main Substitutes

Pyrethroids, commonly referred to as "synthetic pyrethroids" (a redundant phrase!), are related in structure and action to the naturally occurring botanical insecticides, pyrethrins. Pyrethrins have been known from the Victorian Era as being good insecticides. Pyrethrins were obtained by crushing the flowers of the pyrethrum chrysanthemum, *Pyrethrum cinerariaefolium*, and using the dust. Pyrethrins and pyrethroids cause irregular nerve firings by disrupting the sodium channel of the nerve cells. This is where the electrical charge is formed. Exposure to pyrethroids in insects causes loss of nervous coordination and the action is usually rapid. The natural pyrethrin caused rapid knockdown, but insects usually recover after metabolizing the toxin. In order to counteract this, a synergist, piperonyl-butoxide is usually added. Most pyrethroids do not require the

addition of this synergist.

When first synthesized, pyrethroids were generally thought to be much less toxic than the organophosphates and carbamates and most pyrethroids are very poorly absorbed through human skin. This made them less toxic alternatives to organophosphates and carbamates, and their favor was ensured. However, as the class of pyrethroids were refined and developed, the mammalian toxicity levels also began to increase.

Table 1. Pyrethroid Oral LD50s (technical product, based on rodent exposures)

Sumithrin = 10,000
Tetramethrin = 5000
Resmethrin = 2500
Cyfluthrin (=Tempo) = 500
Permethrin (=Astro) = 430
Bifenthrin (=Talstar) = 375
Deltamethrin (=DeltraGard) = 135
Esfenvalerate = 75
Lambda-cyhalothrin (=Scimitar) = 56

Pyrethroids are considered broad spectrum pesticides, being most active against true bugs, bug-like insects (aphids, scales, mealybugs, etc.), beetles (includes weevils), caterpillars, flies (includes gnats and mosquitoes), and wasps (includes sawflies). The earlier pyrethroids also had the same problem as the natural product, short residual activity, often only days. As the pyrethroid chemistry developed, longer and longer residual activities were selected and certain pyrethroids appeared to have toxicity to spider mites. Other pyrethroids seemed to have improved ability to knock down beetles and the true bugs.

Because of their broad spectrum of activity and availability, pyrethroids have been the insecticides of choice as replacements for

organophosphates and carbamates in over-the-counter products. If you look down the pesticide aisles of garden centers, most of the familiar products appear to remain. However, if you look closely at the activity ingredients of these brand-name products, the active ingredients have been switched to a pyrethroid. Some of the common suppliers and the pyrethroids they are using are listed in Table 2.

I have reviewed many of the current labels of the products containing pyrethroids and most of the major suppliers have appropriately changed their labels to include only the pests that are on the counterpart, commercial labels. However, there are some products that appear to have merely kept the original list of pests controlled by the Dursban or diazinon active ingredient but the products now contain one of the pyrethroids. This is highly unfortunate because many of the substituted pyrethroids simply do not kill the same spectrum of pests!

So, how can you tell what works and what doesn't? One way is to go to the Internet and try to find posted labels for the products. If they have the labels posted (again, some of the minor suppliers do not have such web sites!) look for signs of a "National" label and a "California" label. If a separate California label is posted, you will likely find that the listing of pests on the label is shorter than what is seen on the National label. Why? California Department of Agriculture requires efficacy data to be submitted for each pest listed on a label. In short, if the label has "aphids" on it, then California requires some kind of field data that shows aphids as being controlled. They don't require excellent control, but at least some indication that the product works. Remember, the US-EPA does not require such data, only toxicity and environmental effects data.

Table 2. Pyrethroids Used by Some of the

Over-the-Counter Product Suppliers

- Sumithrin [Ortho]
- Tetramethrin [Ortho]
- Resmethrin
- Cyfluthrin (=Tempo) [Bayer Advanced Lawn & Garden products]
- Permethrin (=Astro, Pounce) [Spectracide]
- Bifenthrin (=Talstar) [Ortho & Scotts products]
- Deltamethrin [Bonide]
- Esfenvalerate (=Asana) [Ortho]
- Lambda-cyhalothrin (=Scimitar)

Other Alternative Insecticides

While the pyrethroids form the major group of insecticides used as substitutes, there are some other, notable products now available for the residential user (see Table 3)

Table 3. Oral LD50s of Alternate Insecticides.

Imidacloprid (=Merit) =450
Halofenozide (=March 2) = 2,850
Spinosads (=Conserve) =3,783-5,000
Insecticidal Soaps = 16,900
B. thuringiensis (BT) = 5,000
Azadirachtin (=Neem) =>5,000

Note: Oral LD50 of 50 to 500 is “medium toxicity”; 500 to 2,000 is “low toxicity”; and >2,000 is considered to be “practically nontoxic.”

Imidacloprid (=Merit) is easily obtainable in over-the-counter products. Since this molecule is owned by Bayer, look for the Bayer Advanced Lawn and Garden products. Products for ornamental plants and turfgrass are produced and these are excellent choices for control of soft scales, black vine weevil larvae, beetle

borers (prevention), Japanese beetle adult feeding, and white grubs in turf. The major problem with imidacloprid-containing products is that most residential users still expect to see the “bugs hit the ground screaming!” and that is not the way that the insecticide works. For ornamental plants, imidacloprid should be applied 20 to 30 days prior to anticipated insect problems. This is especially true for scale and borer control where the compound needs to be within the plant tissues at that time the new generation of pests attempt to attack a plant. For grub control, imidacloprid-containing products can be put down from mid-May to mid-August with excellent results. However, if skunks and raccoons are digging in October or April, imidacloprid will not destroy the grubs rapidly enough to stop the animal digging.

Halofenozide (=MACH 2) was the active ingredient in the Scotts' GrubEx product over the last couple of seasons, but Scotts is switching to imidacloprid in 2003. Halofenozide was acquired by Dow Agrosciences in 2001 and they have increased the rate for improved grub control. Though Scotts switched, Dow has contracted with other over-the-counter product suppliers to make halofenozide available to homeowners. I believe that this is important because customers ought to have choices of products to use for grub control! At the time this article was written, Hi-Yield and Fertilome suppliers will be formulating halofenozide. Look for “Kill-A-Grub,” if you want halofenozide in 2003, but other products are on their way. Halofenozide products provide their best level of control when applied in mid-June to mid-August. Halofenozide has not been developed for control of pests on ornamentals though it is known to also control billbugs, cutworms and sod webworms in turf.

Another relatively recent insecticide group is the spinosyns. Spinosyns are compounds extracted

from the fermentation of a soil dwelling actionmycete, *Saccharopolyspora spinosa*. These compounds stimulate the post-synaptic receptor sites of insects: Through the visible results (i.e., muscle tremors, neural collapse, etc.) look like the action of an acetylcholine esterase inhibitor, the mode of action is quite different. In fact, spinosyns only affect the “nicotinic” acetylcholine receptors which is the dominant type in insect but fairly rare in mammals. This is why spinosad (Conserve™) has the very high LD50 of 3800 to 5000 in mammals. Insects affected by spinosad almost immediately stop activity and may experience tremors for hours before actually dying and falling from the plant.

Currently, spinosad (as the commercial product, Conserve from Dow Agrosiences) is registered for caterpillars (sod webworms and cut-worms) in turf and for caterpillars, sawfly larvae, leaf beetle larvae, fly leafminers, and spider mites (suppression only) in ornamental plants. Some over-the-counter product manufacturers are making spinosad available, but I haven’t seen them on the shelves yet. Most are available only through mail order or Internet sites. Check out the Gardens Alive! Site or search for a product – called “Naturalyte”.

Azadirachtin (= neem oil, or Neem) is a botanical insecticide derived from the Neem tree, an Indian and Eastern Asian resident. This product was developed in the 1980s and early 1990s, but few companies picked it up because of the lack of patent protection and inconsistency of early extracts. As purification of the active ingredient has improved, efficacy has been standardized and there are now several suppliers of azadirachtin products, for agriculture, commercial applicators and over-the-counter. Azadirachtin actually acts as an insect growth regulator (IGR), interfering with the molting process. Developing insects exposed to azadirachtin do not molt correctly or stop midway into the molting process. Because

of this unique mode of action, azadirachtin has very low mammalian toxicity, but the action can be relatively slow on insects. The insects have to be given time to enter the molting process! As with spinosad, there are few over-the-counter products to be found with neem. Most are mail order or Internet order products. However, I have heard that one of the major suppliers (Scotts) may have a neem product this season.

Good Old Soaps and Oils!

While I have constantly extolled the benefits of insecticidal/miticidal soaps and horticultural oils, many homeowners just can’t seem to believe that they can work as well as some of the “stronger stuff”! In all the studies I’ve performed or read about, soaps and oils provide consistent control of such common pests as aphids, whiteflies, mealybugs, exposed caterpillars, spider mites and other soft bodied pests. The key to success is adequate coverage since soaps and oils only work when they physically contact the pests. Any residue that remains on plant foliage is no longer active.

Another problem with soaps and oils is that the insects or mites have to be in a susceptible state or in a place where they can be hit by the spray. While armored scale crawlers and recently settled crawlers are highly susceptible to soaps and oils, once they have formed the waxy covering, they are largely impervious to these sprays. Mealybugs produce waxy ovisacs in which their eggs are protected from sprays. So, even though you may kill the mealy bug nymphs and adults with a soap spray, they may seem to reappear in a few weeks because the eggs were not destroyed. This means that two or three sprays may be needed to achieve excellent and lasting control. However, this isn’t much different from using other insecticides!

The Lists!

In order to make things a bit simpler, here is my list of common ornamental and turf insect and mite pests and the products that have been shown to provide control.

Ornamental Plant Pests

Aphids: horticultural oils (1.5-2%), insecticidal soaps, most of the pyrethroids, neem, and imidacloprid.

Black Vine Weevil: (Adults) most pyrethroids, neem; (Larvae) imidacloprid.

Borers (beetles, such as Agrilis and other flatheaded borers and bark beetles): most pyrethroids [though permethrin (as Astro) has been the only product extensively tested; deltamethrin and bifenthrin also show promise as preventives; most have effective preventive residual of 35 to 40 days on the bark of trees and shrub]; imidacloprid (only as a preventive, best applied in October or November for spring-active beetle borers or 30 to 40 days prior to egg laying period).

Borers (lepidopterous, mainly the clearwing moths): most pyrethroids [though permethrin (as Astro) has been the only product extensively tested; deltamethrin and bifenthrin also show promise as preventives; most have effective preventive residual of 35 to 40 days on the bark of trees and shrubs].

Caterpillars (including bagworm, cankerworms, loopers, gypsy moth, hornworms, webworms, tent cats, and other exposed caterpillars): horticultural oils, insecticidal soaps, most pyrethroids, neem, spinosad, and *Bacillus thuringiensis* [Bt] (only for small caterpillars).

Japanese Beetle: (Adults) most pyrethroids work, though bifenthrin, deltamethrin and

lambdacyhalothrin products are providing the longest residual activity; insecticidal soaps (contact only); and imidacloprid (apply early for adult feeding suppression). Most pyrethroids will have to be applied at 7 to 14 day intervals until the major feeding period is over.

Lace Bugs: horticultural oils or insecticidal soaps (must be applied to leaf undersurfaces in order to contact the bugs); most pyrethroids; imidacloprid; and neem.

Leafminers: (to kill adult during egg lay – prevention) most pyrethroids; (to kill larvae within leaves) imidacloprid (except lepidopterous pests) or neem.

Plant and Leaf Bugs: horticultural oils or insecticidal soaps (must be applied where nymphs are active); most pyrethroids.

Sawflies: horticultural oils or insecticidal soaps; most pyrethroids; imidacloprid; neem; spinosad.

Scales (soft): horticultural oils or insecticidal soaps (anytime before the adults begin to swell for egg laying); imidacloprid; most pyrethroids (applied at active crawler or crawler settling).

Spider Mites: horticultural oils or insecticidal soaps (repeat in 5-7 days to catch stages not hit with first spray); spinosad (repeat application likely needed); bifenthrin (pyrethroid with mite activity but repeat applications likely needed).

Thrips: horticultural oils or insecticidal soaps (repeat in 5-7 days to catch pupae that were hidden in soil or other protected sites); spinosad (excellent results); most pyrethroids; neem.

Whiteflies: horticultural oils or insecticidal soaps (thorough application to leaf undersurfaces needed and repeat if adults are

flying in from surrounding areas); most pyrethroids; imidacloprid; neem.

Turf Insect Controls

White Grubs (preventive): imidacloprid or halofenozide.

White Grubs (curative): trechlorfon (=Dylox or Bayer Advanced Lawn 24-hour Grub Control); carbaryl (=Sevin) (Both of these traditional insecticides will be available now, but I'm unsure for future years!)

Chinch Bugs: the pyrethroids bifenthrin, deltamethrin and lambdacyhalothrin have shown the best activity against chinch bugs; imidacloprid also had good activity.

Billbugs: the pyrethroids (especially bifenthrin, deltamethrin and lambdacyhalothrin) have provided good control when applied in early to mid May as a preventive; imidacloprid (note on labels that there is a higher rate recommended); and halofenozide.

Sod Webworms: the pyrethroids (all do a good job); spinosad; halofenozide.

Reprinted from the VNLA Newsletter, January/February, 2004.



Pesticide News

Insecticides:

AKARI (fenproximate) – Sepro – Currently registered to control mites in greenhouses; an outdoor nursery label is expected by early next year.

APPLAUD (buprofezin) – Nichimo America Inc – Added to their label the control of mealybugs, leafhoppers and scales.

DISUS (cyfluthrin/imidacloprid) – Olympic – A new formulation to control various insects on ornamentals, non bearing fruit and nut trees, and in field and container nurseries.

FLONICAMID 50 WG – FMC – A new insecticide being developed for greenhouse use on ornamentals.

FORBID 4F (spiromesifen) – Bayer Crop Science – A new miticide being developed for use on greenhouse and outdoor ornamentals.

PITON 15SC (acequinocyl) – Arvesta – A new miticide expected to be registered in the near future on greenhouse and outdoor ornamentals.

TETRA SAN (etoxazole) – Valent – This miticide is registered for greenhouse usage, as well as outdoor and landscape applications.

TRISTAR (acetamiprid) – Cleary – Registration is expected in the near future on ornamentals.

ULTIFLORA (milbemectin) – Gowan – A new miticide being developed for use on ornamentals.

TALUS (buprofezin) – Nichimo America Inc – Added to their label the usage in greenhouses and a decrease in the preharvest interval. Also

to use on greenhouse and outdoor ornamentals.

V-10112 (dinotefuran) – Valent – A new insecticide being developed as a spray or drench treatment on ornamentals.

Herbicides:

RENOVATE 3 (triclopyr) – Sepro Corp – A new product for the control of woody plants, broadleaf weeds, water lilies, etc. in ponds, lakes and marshes.

Spotlight (FLUROXYPYR) – Dow AgroSciences – A new post emergence herbicide recently registered for use on turf to control various broadleaf weeds.

Fungicides:

FENAMIDONE – Bayer Environmental Science – Proposed to EPA to register this new active ingredient for use on ornamentals.

HEC-5725 (fluoxastrobin) – Bayer Crop Science – A new fungicide being developed for use on potatoes, tomatoes, vegetables, tobacco, turf and ornamentals.

HURRICANE (mefenoxam/fludioxonil) – Syngenta - A new fungicide combination being developed for use on ornamentals to control Pythium, Rhizoctonia and other diseases.

MILSTOP (potassium-bicarbonate) – Bio Works – A new formulation available for use on ornamentals.

MTF-753 (penthiopyrad) – Mitsui Chemical – A new fungicide being developed for use on pome fruits, stone fruits, citrus, tomatoes, cucurbits, ornamentals and turf.

Miscellaneous:

MULTIGUARD (furfural) – Agriguard Co. – EPA received an application to register this new active ingredient as a soil fumigant to use in greenhouses on cut flowers, greens, transplants, propagative materials and other non food items.

2004 pesticide safety education training:

The following dates and times can also be found at: <http://www.udel.edu/pesticide/Cal.htm>

June 21 - 22, 2004, Kent Co. University of Delaware Cooperative Extension Office, Pardee Center, Dover

Sept 28 - 29, 2004, Kent Co. University of Delaware Cooperative Extension Office, Pardee Center, Dover

December 14 -15, 2004, Kent Co. University of Delaware Cooperative Extension Office, Pardee Center, Dover.

The first day is training -- 8:30 am - 4:30 pm. Training continues the morning of the second day, 8:30 am - noon. The exam starts at 1:00 pm the second day.

Research Briefs

Greenhouse Production:

Fresh parboiled rice hulls serve as an alternative to perlite in greenhouse crop substrates. Perlite is a relatively expensive substrate component used to provide air-filled pore space in greenhouse media. Rice hulls are available in large volumes as a waste product of the rice milling industry. Fresh hulls may contain rice seeds and thus present a weed problem for growers. However, parboiled fresh rice hulls (PFH) have been subjected to sterilizing temperatures and should not contain viable weed seeds. For this research, parboiled fresh rice hulls (PFH) were obtained from Riceland Foods, Stuttgart, Ark. Based on plant growth measured in this study, PFH could be effectively used as a lower cost substitute for perlite in greenhouse substrates without a significant reduction in growth or plant quality. (Evans, M.R. and M. Gachukia)

Excerpted from HortScience: 39(2):232-235. 2004.

Leonardite influences zinnia and marigold growth. Leonardite is a naturally occurring, brown-black oxidized form of lignite coal and is primarily comprised of humic substances. A large natural reserve of leonardite exists in the United States in North Dakota, South Dakota, Utah, New Mexico, and Texas. Both zinnia and marigold showed positive growth responses to leonardite additions in both sand and sand:peat (1:1) media compared to fertilizer alone. For growing zinnias, optimal conditions were determined to be 7.5% leonardite in a sand medium for seedlings and 8% in a sand-peat medium for transplants. A sand-peat medium containing 7% leonardite was determined to be optimal for growing marigold seedlings and transplants. Addition of leonardite to growing

medium offers promise for reducing fertilizer use during production of some ornamental plants. Dudley, J.B., J.J. Pertuit, Jr. and J.E. Toler.

Excerpted from HortScience: 39(2):251-255. 2004.

New Guinea impatiens production with controlled release fertilizer in a recirculating subirrigation and top-watering system. New Guinea impatiens grown with controlled release fertilizer (CRF) incorporated were slightly larger than were those grown with CRF top-dressed, dibbled, or placed in the bottom of the pot. For New Guinea impatiens grown in recirculating subirrigation, the optimum rate was determined to be the 1.3x rate. This is contrary to soluble fertilizer added in subirrigation were lower than normally recommended rates for top-watering are optimum. CRFs may successfully be used to reduce runoff of K, even when plants are top-watered, if reasonably leached. An additional benefit of using CRFs is extremely high fertilizer use efficiency. (Richards, D.L. and D.W. Reed)

Excerpted from HortScience: 39(2):280-286. 2004.

Height control of poinsettia using photoselective filters. Height control of poinsettias is usually achieved with growth regulators (PGRs). Although PGRs can effectively reduce internode extension, alternative nonchemical techniques to control plant height are needed to meet environmental pressures for reduced chemical use in horticulture, and to anticipate the potential restrictions of some PGR chemicals in some countries. These studies demonstrate that significant height reductions (20% to 25%) were achieved when poinsettias were grown under fixed FR plastic filters. To optimize light intensity while reducing FR, spectral filters

could be dynamically managed using automatic glasshouse screening mechanisms. For example, FR filters could be deployed only during the first half to two-thirds of the poinsettia production schedule, or filters could be used only during the morning and evening to reduce the natural ambient rise in the R:FR. Lighting studies with tomato and chrysanthemum support this approach, but additional studies with poinsettia are warranted before such strategies should be promoted. (Clifford, S.C., E.S. Runkle, F.A. Langton, A. Mead, S.A. Foster, S. Pearson, and R.D. Heins)

Excerpted from HortScience: 39(2):383-387. 2004.

Effect of phosphorus and nitrogen in impatiens tissue on western flower thrips (WFT) populations. In the greenhouse industry P fertilizer has been historically over-applied, raising concerns about pollution associated with nutrient effluent. These results provide evidence that growers should manage P fertility to minimize luxurious accumulation of this nutrient because it may support more rapid growth of WFT populations. Nitrogen fertility within the range that produces sommerically acceptable impatiens does not impact WFT populations. (Chen, Y., K.A. Williams, B.K. Harbaugh and M.L. Bell)

Excerpted from HortScience: 39(3):545-550. June 2004.

Cut Flowers:

Performance of deciduous holly branches as cut stems. ‘Bonfire’ and ‘Sunset’ had the highest rating for marketability based on the longevity and quality of their fruit. ‘Bonfire’ and ‘Winter Red’ had the highest fruit density per stem. Treatment with floral preservatives significantly increased the display life of holly branches. Cold storage of dry branches did not

significantly reduce branch display life if held for 23 days or less. Cut branches of all cultivars had a longer display life when stuck in sand and left outdoors in a lath house than when rated in vase solutions indoors. (Jones, M.L., K.K. Cochran, G.A. Anderson and D.C. Ferree)

Excerpted from HortTechnology: 14(2):230-234. April-June 2004.

Container Production:

Overwintering of five ornamental grasses in container production. *Sporobolus heterolepis* (prairie dropseed) and *Miscanthus sinensis* 'Variegatus' (variegated Japanese silvergrass) had significantly lower overwintering survival than *Schizachyrium scoparium* (little bluestem), *Calamagrostis x acutiflora* 'Karl Foerster' (feather reedgrass) and *Miscanthus* 'Purpureus' (flamegrass). Container size and media (different levels of porosity) did not effect overwintering survival. Fall propagation of these two species could result in higher losses and may be a risk for commercial growers. (Meyer, M.H. and B.A. Cunliffe)

Excerpted from HortScience: 39(2):248-250. 2004.

Growth response of *Hakonechloa macra* 'Aureola' to fertilizer and lime in the potting mix. These findings clearly support recommending production of *Hakonechloa* in soilless potting mix with pH=4.5 and constant fertigation with N at 8 mmole/L. (Harvey, M.P., G.C. Elliott and M.H. Brand)

Excerpted from HortScience: 39(2):261-266. 2004.

Liquid exponential and controlled-release fertilizers on juniper and potentilla. Liquid exponential fertilization involves applying nutrients exponentially to march plant growth.

Both exponential fertilization and controlled-release fertilizers deliver discreet amounts of fertilizer over time. However, the availability of controlled-release fertilizers to plants in temperature dependent and not readily predictable outdoors. The loss of controlled-release fertilizer can be substantial during the initial part of the growing season when plant nutrient uptake is low. Growth with exponential fertilization was better with juniper an similar with potentilla compared to plant growth when fertilized with controlled-release fertilizers. Exponential fertilization provides a method to provide plants with nutrient in such a matter as to match their growth requirements. (R,K, Dumroese)

Excerpted from HortScience: 38(7):1378-1380. 2003.

Fertilization of ornamental cabbage.

Nitrogen concentrations greater than 140 mg/L were required for ornamental cabbage plants during both the establishment and coloration phases of growth. Center head coloration was not inhibited by N concentrations as high as 250mg/L. Ornamental cabbage should be considered an exception to other floriculture crops, as fertilization needs to be continued through center-head coloration in order to maintain adequate nutrient levels. (Gibson, J.L. and B.E. Whipker)

Excerpted from HortScience: 38(7):1381-1384. 2003.

Ground bovine bone as a perlite alternative.

Higher amounts of bone would be required to achieve a similar air-filled pore space as a given amount of perlite. When placed in a moist substrate, salts within the bone were able to leach over time into the substrate causing the pH, EC, and NH_4^+ to increase enough to cause plant mortality. Therefore, the ground bovine bone used in this study was not a suitable

alternative to perlite. (M.R. Evans)

Excerpted from HortTechnology: 14(2):171-175. April-June 2004.

Processed poultry feather fiber as an alternative to peat. Waste poultry feathers were washed, pressed, disinfected and ground to produce a fibrous material that can be used as a component to reduce the amount of peat required to formulate substrates used to grow containerized greenhouse crops. Plants grown in peat-based and perlite-based substrates or the commercially obtained SB-3000 substrate containing up to 30% feather fiber had similar dry shoot and dry root weights as those grown in substrates containing 0% feather fiber. When the amount of feather fiber exceeded 30%, shoot and root growth declined. For all species tested, plants grown in substrates containing up to 30% feather fiber were of marketable qualities. (M.R. Evans)

Excerpted from HortTechnology: 14(2):176-178. April-June 2004.

Media amended with noncomposted recycled waste. WastAway Services, LLC, McMinnville, TN produced the noncomposted recycled waste used in this project. The production of the recycled waste begins with raw residential refuse. It undergoes a proprietary process and results in an odorless, aseptic material that resembles attic insulation. This experiment demonstrated that up to 25% noncomposted recycled waste could be utilized in container media production. (Kahtz, A.W. and N.J. Gawel)

Excerpted from HortTechnology: 14(2):192-195. April-June 2004.

Effect of fertilizer source on formation of arbuscular mycorrhizae (AM). This research looked at whether a selection of commercial

controlled-release inorganic fertilizers (CRI) were more compatible with AM fungal colonization than progressive-release organic fertilizers (OR). OR fertilizers have greater compatibility with AM than CRI fertilizers with high P formulation. However, using CRI fertilize formulations with lower P also allowed substantial mycorrhizae formation, although growth was initially enhanced over the nonmycorrhizal treatments. (Linderman, R.G. and E.A. Davis)

Excerpted from HortTechnology: 14(2):196-202. April-June 2004.

Fertilizer requirements for container-grown boxwood. *Buxus sempervirens* 'Suffruticosa', *B. sempervirens* 'Vardar Valley' and *B. sinica* var. *insularis* 'Justin Brouwers' achieved maximum shoot dry weight (OSDW) with .42 to .56 oz Osmocote per 3 liter (#1) container and 100 to 125 ppm N from a 10-4-6 liquid fertilizer. Boxwood typically produce a single flush of growth in the spring and fertilizer treatments did not promote additional flushes. (Musselwhite, S., R.Harris and R. Wright)

Excerpted from J. Environ. Hort: 22(1):50-54. March 2004.

Field Production:

Paclobutrazol drenches of rhododendron rooted cuttings. Paclobutrazol is a triazole growth regulator that inhibits stem elongation and promotes flowering of field-grown rhododendron. Paclobutrazol was much more effective when applied as a drench to cuttings of large leaved rhododendron (*Rhododendron catawbiense*) before transplant. Paclobutrazol at 2 mg/L applied to rooted cuttings before transplant was sufficient to inhibit growth of rhododendron, but not to the point where later flushes of growth were excessively short. (M.P.N. Gent)

Excerpted from HortScience: 39(1):105-109.
2004.

Landscape:

Explaining poor transplant success of *Kalmia latifolia*. *Kalmia latifolia*, while it has a fibrous root system, often does not survive transplanting from containers into the landscape, even in areas to which it is indigenous. This experiment looked at both shoot and root growth of *Kalmia latifolia* 'Sarah' (difficult to transplant species) and *Ilex crenata* 'Compacta' (easy to transplant species). These species had similar top growth after transplanting but *Kalmia latifolia* had significantly slower root growth. The final root:shoot ratio of *Kalmia latifolia* 'Sarah' was one-ninth that of *Ilex crenata* 'Compacta'. Results suggest that poor transplant performance of *Kalmia latifolia* in the landscape may be related to its slow rate of root growth. (Wright, A.N., S.L. Warren, F.A. Blazich and U. Blum)

Excerpted from HortScience: 39(2):243-247.
2004.

Soil amendment with cotton gin waste. Plant growth responses of three corps of landscape plants measured for 365 days show that amending a Savannah sandy clay soil with pine bark plus nitrogen or pine bark plus cotton gin waster resulted in superior plant growth compared to pine bark soil amendment alone. In some instances pine bark amendment alone suppressed growth. (Sloan, R.C., R.L. Harkess and W.L. Kingery)

Excerpted from HortTechnology: 14(2):212-217. April-June 2004.

Insect Control:

European chafer grubs damaging in field ground nursery crops. European chafer and

other white grubs are serious pests of woody nursery crops in commercial nurseries. Depending on plant size, even relatively low numbers of grubs can cause severe damage. Subsurface treatments of insecticides, where insecticides are delivered directly to the root zone, can be very effective as rescue treatments against some species of white groups. The treatments worked on hemlocks and rhododendrons with fairly small root systems and in fairly porous soils. (Reding, M.E., M.G. Klein, R.D. braze and C.R. Krause)

Excerpted from J. Environ. Hort: 22(1):32-36.
March 2004.

Weed Control:

Diuron controls oxalis in container grown nursery stock. Diuron (Direx 4L) provided oxalis control when applied postemergence over-the-top to dormant camellia, liriopie and spirea at rates as low as 0.5 lb ai/A while causing no slight to no crop injury applied as an over-the-top spray before active growth of the nursery crop begins. Diuron may provide growers with an alternative to hand-weeding, especially when container-grown nursery crops are emerging from over-wintering and oxalis, a cool season weed, is problematic. (Simpson, C.V., C.H. Gilliam, J.E. Altland, G.R. Wehje and J.L. Sibley)

Excerpted from J. Environ. Hort: 22(1):45-49.
March 2004.

Disease Control:

Less anthracnose on *Euonymus fortunei* with lower night temperatures. Common anthracnose symptoms on *E. fortunei* include leaf drop, leaf lesions, stem lesions, and stem dieback. In this study, lower disease rating occurred with a 19.3°C night temperature than with a 28.6°C night temperature. 'Emerald

Gaiety' was less susceptible to anthracnose than 'Emerald 'n Gold' or 'Canadale Gold'. (Ningen S. S., J.C. Cole and K.E. Conway)

Excerpted from HortScience: 39(2):230-231. 2004.

Pythium in recycled nursery irrigation water.

Pythium species are important pathogens of numerous ornamental plants in nursery production and in the landscape. They also are well known water molds and abundant in irrigation systems. Of over 800 isolates recovered from nursery irrigation water 23 major species of *Pythium* have been identified. We selected and tested 40 isolates for pathogenicity to cucumber and geranium. All isolates except for one caused poor germination, root rotting, plant stunting or death with either plant species. Chlorine sensitivity testing at different solution strengths resulted in the following; no *Pythium* colonies were recovered for any isolates at 2 ppm or above, but substantial numbers of colonies were recovered for a majority of the isolates at 1 ppm. So, failure to maintain the recommended 2 ppm chlorine may expose entire crops in the production facility to *Pythium* diseases. (Hong, C, P. Kong and P. A. Richardson)

Excerpted from VNLA Newsletter, March/April 2004.

Nutrient phosphite controls phytophthora

shoot blight on annual vinca. Potassium phosphonate or phosphite, marketed as a phosphorus nutrient supplement, also has fungicidal properties against phytophthora. Foliar applications of a commercial phosphite foliar nutrient applied at 0.125 ml/liter (1.6 oz/100 gal) at intervals of three to six days provided protection similar to that of Aliette applied at 3 g/liter (2.3 lb/100 gal) at 14 day intervals. This suggests regular applications of a phosphite nutrient through an overhead

fertigation system could suppress phytophthora-incited foliar diseases at a relatively low cost. (Banko, T.J. and C.X. Hong)

Excerpted from J. Environ. Hort: 22(1):41-44. March 2004.

New Plant Introductions:

'September Sun' Seaside Alder. 'September Sun' is the first cultivar selected from seaside alder (*Alnus maritima*), a rare species that occurs as three disjunct subspecies (one of which is in Delaware). 'September Sun' thrives in wet soils, can survive complete inundation of its root zone with fresh water indefinitely, and is more resistant to drought than are other alders. Mature plants are large shrubs or small trees with multiple trunks. Leaves of 'September Sun' are mottled yellow, orange and rich brown in fall. This alder blooms in mid-August to late-September with yellow, pendulous catkins that provide color in the landscape after flowering has ceased on most other trees and shrubs. Brown clusters of fruit persist on branches for at least one more season, providing subtle ornamental appeal throughout the year. 'September Sun' has been propagated at Iowa State University and is being distributed to nurseries. Contact the authors (graves@iastate.edu) to request rooted stem cuttings or for a list of commercial sources. (Graves, W.R. and J.A. Schrader)

Excerpted from HortScience: 39(2):438-439. 2004.

***Nymphaea* 'William Phillips'**. This is a tropical water-lily with highly desirable ornamental qualities. *Nymphaea* 'William Phillips' is a tuberous, perennial, aquatic herb. Flowers are solitary, emergent, diurnal and sweetly scented. Petals of first-day flowers are violet-blue. Stamens have carmine anthers that turn greyed-orange with age. Tubers are the

only practical means of increasing nursery stock. Plants will be distributed to major aquatic plant nurseries throughout the country. (Doran, A.S., D.H. Les, M.L. Moody and W.E. Phillips)

Excerpted from HortScience: 39(2):446-447. 2004.

***Capsicum annuum* ‘Tangerine Dream’.** The Agricultural Research Service of the USDA announces the release of this new pepper cultivar ‘Tangerine Dream’ as a crop growers can add to their bedding and landscape plant assortment. It is an ideal choice as an edible landscape ornamental. ‘Tangerine Dream’ has a striking prostrate growth habit and dark green foliage, which contrasts well with the brightly colored upright fruit. It is not recommended for production as a potted crop in greenhouses. Seed of ‘Tangerine Dream’ can be obtained from PanAmerican Seed Co. via W. Atlee Burpee and Co., 300 Park Avenue, Warminster, PA 18991. (Stommel, J.R. and R.J. Griesbach)

Excerpted from HortScience: 39(2):448-449. 2004.

***Hemerocallis* ‘Chesapeake Belle’.** ‘Chesapeake Belle’ is a daylily cultivar with leaves reaching 6 inches and a flowering stalk that is about one foot tall. Yellow flowers begin in June and continue into late November. It is designed for the garden border, rock garden or containers and is effective in mass plantings at garden edges. ‘Chesapeake Belle’ will grow and flower in partial shade and dry soil, but produces more flowers in full sun with even moisture. Plants are available from DayLily Nursery, 471 Mud Creek Road, Rock Island, TN 38581; William Natrop Do., 8601 Snider Rd., Mason, OH 45040; and McCorkle Nurseries, 4904 Luckey’s Bridge Rd., Dearing, GA 30808. (R.J. Griesbach)

Excerpted from HortScience: 39(1):190-191.

2004.

‘Prairie Chief’ Big Bluestem. *Andropogon gerardii* ‘Prairie Chief’ is being introduced for landscape planting. It displays an upright habit that is slightly more open than ‘Sentinell’ and red, purple, and orange fall color. ‘Prairie Chief’ has an upright-arching habit and is not a rampant spreader. It performs well in hot, humid summers as well as in cold winters. ‘Prairie Chief’ has been successfully propagated by divisions taken in both autumn and mid-to-late spring using 10 to 15 cm rhizomes. Limited numbers of plants are available by making a request for potted plants to the corresponding author (tvoigt@uiuc.edu) (Tallarico, J.P., T.B. Voight and K.R. Robertson)

Excerpted from HortScience: 39(3):639-641. June 2004.

Marketing:

Consumer survey measuring IPM awareness and value of dogwood powdery mildew resistance. A survey of visitors to home and garden shows in Tennessee, Michigan and Mississippi was conducted. Fewer than half the respondents in any city indicated familiarity with IPM. Average tree premiums for a powdery mildew resistant tree ranged from \$11.87 in Jackson, Mississippi to \$16.38 in Detroit, Michigan. Customers are willing to pay a substantially higher price for a landscape tree that will maintain a healthier appearance without the use of chemical sprays. (Klingeman, W.E., D.B. Eastwood, J.R. Brooker, C.R. Hall, B.K. Behe and P.R. Knight)

Excerpted from HortTechnology: 14(2):275-282. April-June 2004.

Calendar

June 21 – 22 – Pesticide Training, Kent Co. University of Delaware Cooperative Extension Office, Pardee Center, Dover. The first day is training -- 8:30 am - 4:30 pm. Training continues the morning of the second day, 8:30 am - noon. The exam starts at 1:00 pm the second day. For more information visit

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

June 22-23 – Virginia Turfgrass Council Demo Days, Hampton Roads AREC, Virginia Beach, Contact: (540)942-8873.

June 24 – Good Underused Plants for the Landscape. Short Course taught by Dr. John Frett from 5-7 PM in UDBG. Contact Dot Milsom, 302-831-2531.

June 24 – Interiorscape Conference, Montgomery College, Germantown, MD Suzanne Klick, (301)596-9413.

June 24-26 – Outdoor Power Equipment Institute Inc. annual meeting, Hotel Hershey, Hershey, PA (703)549-7600.

June 26 – Identifying and Controlling Invasive Plants, 9am – 12noon, Brandywine Valley Association(BVA). Contact: Cheryl Bjornson, (610)696-3500.

June 26-29 – Seeley Conference “Understanding the Consumer: Is Floriculture Relevant?” Cornell University, Ithaca, NY, seeleyconference@cornell.edu

June 27-30 – Garden Centers of America Specialty Tour, Williamsburg/Tidewater, VA area; contact: (888)648-6463, info@gardencentersofamerica.org

July 8 – Grounds Managers Summer Field Day, Brandywine Picnic Park, Pocopson, PA. Contact: Nancy Bosold, (610)378-1327.

July 5-10 – Perennial Plant Symposium and Trade Show, Grand Hyatt NY City: Educational Lectures and Tours. Contact (614)771-8431, ppa@perennialplant.org

July 6-8 – Perennial Plant Trade Show, contact: (614)771-8431, ppa@perennialplant.org.

July 10-14 – 2004 OFA Short Course * Educational

Seminars. For more information call: (614)487-1117, Fax: 614-487-1216, e-mail: ofa@ofa.ore, www.ofa.org

July 13 – Landscape Design for Delaware Short Course taught by Susan Barton from 6:30- 8:30 PM at Research & Education Center. Contact Dot Milsom, 302-831-2531.

July 14 - Advances in Turfgrass Science CCA Program (12:30 to 4:30 PM); A Turfgrass Management Workshop sponsored by Northeast Branch - American Society of Agronomy & Northeast Branch - Soil Science Society of America & Rutgers Center for Turfgrass Science. Rutgers EcoComplex – Auditorium, Bordentown, NJ. For more information, visit

<http://www.ecocomplex.rutgers.edu/nebasa/>

July 15 – Troubleshooting Landscape Problems taught by Bob Mulrooney, Jo Mercer, Sue Barton from 6:30- 8:30 PM at New Castle County Extension office. Contact Dot Milsom, 302-831-2531.

July 16 – Conference on Woody plants. Longwood Gardens Inc., the Morris Arboretum of the University of Pennsylvania, the Pennsylvania Horticultural Society, The Scott Arboretum of Swarthmore College, Tyler Arboretum. Scott Arboretum of Swarthmore College, Swarthmore. Call (610)388-1000; Internet www.scottarboretum.org/pages/events.summer.html

July 22 – Green Industry Professional Field Day & Trade Show, American University, Washington, DC, sponsored by PGMS-DC, NVNLA; Contact: (703)250-1368.

July 27 – Pruning Short Course taught by Jo Mercer and Susan Barton from 6:30- 8:30 PM at New Castle County Extension Office. Contact Dot Milsom, 302-831-2531.

July 27-29 – Penn Allied Nursery Trade Show (PANTS), www.pantshow.com, (610)544-5775.

August 7-11 – International Society of Arboriculture (ISA), 80th Annual Conference & Trade show, Pittsburgh, PA, David Lawrence Convention Center, Contact: (217)355-9411, isa@isa-arbor.com, www.isa-arbor.com

August 12-14 – SNA Conference & Trade Show, Georgia World Congress Center, Atlanta, Contact: (770)953-3311.

August 18 - Summer Turf and Nursery Expo. Jonathon's Landing Golf Club. Contact Valann Budischak (888)448-1203 or (610)274-2166.

September 11 – UDBG Friends Fall Plant Sale, 9 AM – 2

PM, University of Delaware Botanic Gardens, Newark, DE.

September 14 – Ornamentals Research Expo – 5-8 PM at UDBG. Contact Dot Milsom 831-2531.

September 23 – Nursery and Garden Center Tour, Eastern Shore of Maryland and Delaware. Contact: Dave Suchanic (610)489-4315 for more information.

September 28 – Fertilizing Greenhouse and Nursery Crops taught by Jay Windsor and Gordon Johnson from 7-9 PM at Research & Education Center. Contact Dot Milsom, 302-831-2531.

September 28-29 – Pesticide Training, Kent Co. University of Delaware Cooperative Extension Office, Pardee Center, Dover. The first day is training -- 8:30 am - 4:30 pm. Training continues the morning of the second day, 8:30 am - noon. The exam starts at 1:00 pm the second day. For more information visit <http://www.udel.edu/pesticide/Cal.htm>

October 19 – Landscape Design for Delaware taught by Sue Barton from 7-9 PM at Kent County Extension Office, contact Dot Milsom 831-2531.

October 25-29 – Horticulture Short Course – English and Spanish, Montgomery County, 4-H Center, Creamery, PA. Contact: Mary Concklin, (610)489-4315 for more information.

December 14-15 – Pesticide Training, Kent Co. University of Delaware Cooperative Extension Office, Pardee Center, Dover. The first day is training -- 8:30 am - 4:30 pm. Training continues the morning of the second day, 8:30 am - noon. The exam starts at 1:00 pm the second day. For more information visit <http://www.udel.edu/pesticide/Cal.htm>

