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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.

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

Greetings! Hope this finds all of our members enjoying a busy and prosperous season.

The DNLA is starting from the “ground up”, and getting down and “dirty”, at this year’s annual Summer Turf and Nursery Expo. The event, to be held on Wednesday, August 16th at Jonathan’s Landing Golf Club, will feature exhibitors and some outstanding speakers. And, as you’ve probably guessed by now, our talks will be focusing on soils. Gordon Johnson (UD) will simplify the often confusing process of Soils – Testing, Interpreting & Correcting. Dick Pack (Grizzly’s Landscape Supply & Services) and Greg Binford (UD) will identify and discuss the soil types in our area, and the various soil amendments on the market in their talk entitled, Soils and Soil Amendments. Last, but far from least, the ever-popular duo of Tracy Wootten and Jay Windsor (UD) will challenge us with a weed identification and control problem-solving workshop. In a nutshell:

TOP 10 REASONS TO ATTEND THE DNLA SUMMER TURF & NURSERY EXPO

1. It’s a great opportunity to take a much-needed breather from the blur of the summer.
2. Visit with exhibitors – see their products and new equipment. You may not have had time to go to their place of business. Now they’re coming to you.
3. Visit with industry friends.
4. Hear from some outstanding speakers.
5. Obtain a pesticide credit and a couple of nutrient management credits.
6. Golfers can join their friends and associates for our Annual Golf Tournament.
7. Non-golfers – it’s only half a day! If needed, you can put out all work-related fires in the afternoon.

8. If you’re going to sweat anyway, you might as well have fun doing it.
9. WEVE GOT GOOD FOOD!
10. WE’VE GOT BEER!

Keep the Landscape Awards in mind throughout the summer. Applications go out in the beginning of September. The deadline for entries is September 28th. We encourage any/every member to submit an entry!

Other News:

The DNLA website is being loaded with information and data. It’s a long-grueling process but it’ll be great when it’s done! Please stay tuned. Thanks for your patience!

On a more somber note, the DNLA would like to express their deepest sympathy to the John Ellingsworth family. Mrs. Rebar, John’s mother-in-law, passed away in May. She will be sorely missed.

NEW CNP’s:

Jill Wright
Wright’s Lawn Care & Landscaping, Inc.
Landscape Specialist

Jami Rohl-Hill
All Seasons Nursery & Garden Center
Garden Center Specialist
Greenhouse Production Specialist

Rodman Gross
Pettinaro/Concord Nurseries
Landscape Design Specialist

Welcome New Members:

Active Members
Streevy’s Landscaping
2002 Harrison Avenue
Wilmington, DE 19809
(302) 420-0849

U of D NEWS

Susan Barton, Extension Specialist

The Ornamentals Research Expo has been scheduled for September 14 from 4 to 7:30 PM at the UDBG. This traditional September evening is designed to showcase University research, current important industry topics and the plants and gardens of the UDBG. This year's theme is the "Urban/Wildlife Interface." We plan to discuss both attracting desirable wildlife and avoiding undesirable pests. The evening will begin at 4 PM with registration and exhibits (Backyard Wildlife Habitat Program, Backyard Composting (and how the new yard waste ban will affect you), Ornamental Insects Quiz, Fire Ant Issue, Plants for a Livable Delaware, Sudden Oak Death Survey and more). We plan to offer two tours—one of Doug Tallamy's suburban biodiversity research plots and one focusing on the new All American Selections (and other cool new plants) in the UDBG led by Bob Lyons. We will also have a pest walk (one pesticide recertification credit will be provided) led by Bob Mulrooney and Brian Kunkel (our new Extension IPM Specialist). Dinner will be subs, chips and cookies. AND of course we will have the plant give-away with John Frett describing underused woodies and perennials that we'd like to get out into the industry. Everyone will be welcome to take home a few plants, try them in the nursery or garden and report back on how they perform. The cost for this event is a mere \$10. You should be receiving a flyer in August.

We are also planning to have several Fall Short Courses including:

Ornamentals Diseases and Their Control* - September 18 and 20 – Fischer Greenhouse, Newark, DE, Bob Mulrooney, 3:30 – 6 PM, (\$10)

Landscape and Turf Weeds and Their

Control* - October 3 – Kent County Extension Office, Dover, DE, Gordon Johnson, 3:30 – 6 PM and October 5 - Fischer Greenhouse, Newark, DE, Steve Hart, 3:30 – 6 PM, \$10 (or \$5 for one session only)

Ornamentals Insects and Their Control* - October 10 –12 – Research and Education Center, Georgetown, DE, Dewey Caron and Brian Kunkel, 3:30 – 6 PM (\$10)

*5 pesticide credits will be awarded for attendance

Composting Yard Waste: An Alternative To Landfills - Starting in January, legislation will be prohibiting yard waste material from entering Delaware landfill areas. Composting biomass is one option of reducing this 'waste' material into a soil amendment. Participants will learn more about the legislation and alternative methods to continue the collection of biomass, but with a more environmental sound and economical outcome.

September 11 - Kent County Cooperative Extension office, Dover Conference rooms #109 & #110, Dot Abbott, 6- 8 PM, (\$5)

September 18 - Carvel Research & Education Center, Georgetown, Carvel Conference Room #3, Dot Abbott, 6-8 PM, (\$5)

September 25 - New Castle County Cooperative Extension office, Newark (their new location) Dot Abbott, 6-8 PM, (\$5)

Another great offering this fall is from the UDBG:

Asters: Autumn Stars and Their Companions
Lecture by Jeanne Frett, Research Horticulturist, Mt. Cuba

Wednesday, September 6, 2006
7:00 – 8:00 p.m.

Join Jeanne Frett in an illustrated lecture to learn about the best asters for the fall garden. Mt. Cuba studied 56 aster types and chose the best for growing in the mid-Atlantic region. You'll learn about flower color, height, culture, diseases, pests, and bloom period. Lecture open to the public; registration required. Refreshments served. Also receive 1 copy of the color research report entitled *Asters for the Mid-Atlantic Region: Performance Evaluation and Recommendations for Landscape Use* at the lecture.

Cost: Free to UDBG Friends' Members; \$5 Nonmembers

Location: Room 132 Townsend Hall, University of Delaware, 531 South College Avenue, Newark DE
For registration information, please call (302) 831-2517

Plants will be available for sale at the UDBG Friends Florabundance Plant Sale, Saturday, September 9, 9:00 a.m. – 3:00 p.m. For a plant list, go to <http://ag.udel.edu/udbg/plantsale/pdf/fall.pdf>

DIANTHUS NAMED PERENNIAL PLANT OF 2006

Dianthus gratianopolitanus 'Feuerhexe' (Firewitch) has been the 2006 Perennial Plant of the Year by the Perennial Plant Association, recognizing it for outstanding performance and versatility in the garden. Commonly known as carnation, Sweet William or cheddar pink, the species has annual, biennial and perennial varieties that bloom in shades of white, pink and red. Firewitch has evergreen foliage that is bluish-gray that contrasts with the hot pink blooms that first appear in the spring and may rebloom in the summer and fall if spent flowers are removed. This alpine perennial, which reaches a height of 8 inches, is hardy from zones 3-9 and will perform in a sunny location with a well-drained neutral to slightly alkaline soil. Mature Dianthus can be propagated by division before or just after blooming in the spring.

MARKETING TIPS FROM IAN BALDWIN

**Kathy Severbeck,
Horticulture Management Associates**

Gardening is no longer the #1 pasttime in this country, partly because Baby Boomers are more interested in their pensions and retiring than they are in their *Penstemons*, according to Ian Baldwin, a consultant to garden centers, nurseries and professional organizations for the past 25 years. Meanwhile the next generations see gardening as a project related to property value and not as a hobby or past time. Now more than ever, a manager must reduce sales risks and develop strategies for the next ten years that will ensure success.

With an emphasis on retail garden centers, Baldwin began with an overview of the market. The typical consumer, according to Baldwin has a distrust of retailers and service providers. They do not expect garden centers to be unbiased and they are only as good as the last visit. These consumers tend to remember the negatives more than the positives. They often have more information than those they buy from because of the Internet. The public, according to Baldwin, has high expectations and high stress – often self-induced! Personal debt is at an all time high in July, which was a zero savings month by many consumers, who have a desire for self-indulgences, and rewards because they feel they deserve them. Many desire to own a home. Today, 70 percent of Americans own a home and the demand continues to rise. Landscaping business is expanding very rapidly because of home ownership and low interest rates in the real estate market. More young people are buying their first home ten years before their parents did.

The next generation is very different from the 76 million Baby Boomers whose spending drove the garden business for decades. Baby Boomers are saving for retirement, downsizing homes or

traveling. Garden activity is no longer central to their lifestyle, but outdoor living is. The core customer is changing. Baby Boomers saw garden centers as a partner in the progress of developing their gardens. The next generation wants first time project success or they will give up and go elsewhere, determined to get the result they want. The process does not interest them. It is the end product.

The life style of this generation is different from the Baby Boomers. Four landscapes projects Baldwin predicts will become important in the next decade.

1. Property enhancement – one-time project, high status, low work. Hire out the lawn work.
2. Family area for ball games, play, pets
3. Entertainment area – patio or deck as an extension of the home; Outdoor living is the latest trend.
4. Retreat area – 29 percent of American homeowners work from the home and they want an area with privacy, peace, wildlife or good views from the indoor desk.

Outdoor living is a lifestyle that is currently very popular. National retailers, cheap money and the media are inspiring consumers to expand their homes outdoors. Although time spent in the garden has dropped from 15 hours to 6 hours a week, homeowners want the landscaped look but they see gardening as a means to achieve this end rather than a leisure activity, Baldwin said. The next generation places considerable value on their personal time and they want projects done quickly. They go into debt more easily and do not see money as a barrier to the projects they want. These young homeowners that Baldwin interviewed said they see their home as an investment to build personal wealth and not as a place to put down roots and plant a garden.

Baldwin said not to underestimate the emerging homeowners and to take advantage of these new trends. These lifestyle style changes mean retailers should position products and home improvement projects based on how they will increase the value and resale potential of the home. New product development is essential. Young homeowners want options and they want products that reflect their personal style. They want information at the point of sale that will help them make the right product selection in the store. Focus on reaching young homeowners via improved packaging, in-store displays, and demonstrations. Open lines of communication are essential. More than ever garden centers need to sell a vision and solution not just products.

Several methods of appealing to this consumer Baldwin said is to create a series of outdoor living rooms, cross merchandising the various departments in the store by developing displays such as

- Front/rear patio, front porch outdoor artwork
- Family/pets/wildlife sanctuary
- Pools/spa surrounds that flaunt luxury
- Tuscan/Provencal/Florida Keys “look” (use travel books for ideas)
- Indoor-outdoor reading areas
- Patio for the wired or wireless
- Backyard Vacation/holidays at home
- Oasis of peace and relaxation

These new trends give retailers a huge opportunity to sell hard and green goods as the heart of the outdoor living business. It may mean, however, Baldwin said they may have to reduce the wide selection and varieties of one plant when the new customers want the retailer to tell them which one they need to plant. It may mean a reduced selection of “hobby” products like fertilizers, chemicals and less duplication of brands and line. Employees will need to sell projects not just a product and may

need to be cross-trained to meet this new demand. They will need to inspire the customers with the end result and less with the process. The approach will be less “how to grow... and be a more consultative selling one. They will be required to sell a vision and solution, not products.

Garden centers could become landscape project centers. Baldwin states that the emphasis will be on the projects and the sellers need to stress changes of success and the increased value in a short amount of time. He suggests using mature plants in demonstration sets. They can show a project in phases but the results need to be gorgeous in as little as one year, not five.

Baldwin predicts that current spending could double from @\$2,000 to \$4,000 a year on gardening-related items, projects and services in the future. Retailers need to quote the projects at a do-it-yourself price and a do-it-for-me price. Realizing that the next generation is more likely hire it out than do it themselves, a smart retailer will partner with a bank to offer easy terms.

This new strategy is logical, achievable and very promising. It offers a higher gross margin and return on investment, Baldwin said. It will make the independent retailer less vulnerable to the box stores and cookie cutter landscape design-builders. But Baldwin warned that it will take time to convert retail centers and it may take the selling team out of their comfort zone. There will be costs – employees, customers, capital investment and sleep at first. But as the market moves so do the smart market-driven companies.

Reprinted from VNLA News, March/April 2006.

BITTERCRESS (CARDAMINE SSP) MANAGEMENT IN NURSERY PRODUCTION

Jeffrey F. Derr, Weed Scientist, VA Tech

Bittercress is a common and troublesome weed species in nursery production, especially in containers. Previously, the plant was identified as hairy bittercress, although now it appears that there are different species that infest nurseries. Work done by Glenn Fain, James Altland, and Timothy Reinhart suggests that in landscapes, *C. hirsuta* is the predominant species. In containers, however, there may be multiple species, including *C. scutata* (Japanese bittercress), *C. flexuosa* (flexuous bittercress, woodland bittercress), and possibly *C. oligosperma* (little western bittercress). The landscape species identified as hairy bittercress exhibited pubescent leaves and 100% of the flowers had 4 stamens. By comparison the leaves of all other taxa were glabrous and 100% of the flowers had 6 stamens. The bittercress species that infest field production thus may be different than the ones that invade container production. More genetic research is needed to identify the bittercress species infesting container nurseries.

Hairy bittercress is a winter annual, commonly germinating in fall and flowering in late winter or early spring in the field. It has a basal rosette of lobed leaves, small white flowers, and is a member of the mustard family. Bittercress species are essentially year-round problems in container nurseries, though, probably due to the frequent irrigation, which creates a cooler, wetter environment that favors growth of this weed. Bittercress is a common weed in greenhouses, including propagation, which also contributes to the problem in containers maintained outdoors. The cigar-shaped seed

Pods forcefully expel seed when mature, throwing seed 3 to 6 feet. Since newly-shed seed can germinate, allowing a few bittercress plants to flower can rapidly lead to an infestation throughout the nursery.

Through a grant from the Virginia Nursery and Landscape Association, I evaluated control options for bittercress. The species I worked with in my container trials has been tentatively identified as *C. flexuosa* (flexuous bittercress). I tried to include hairy bittercress, the species I see in field situations, in these trials but it did not grow well in a pine bark-based medium, supporting the contention that different bittercress species infest container versus field situations.

In my preemergence trials, the most effective treatments for flexuous bittercress control were Snapshot (200lb/acre rate), Gallery, Dimension, and Goal. These four herbicides provided essentially 100% bittercress control. BroadStar, Snapshot (100lb/acre rate), Pendulum 2G, Ronstar, Surflan, and Pennant Magnum gave fair to good control, ranging from 74 to 88% control, Rout, OH2, and Regal O-O gave lower control, which was surprising since these 3 granular products contain the same active ingredient as in Goal. Perhaps coverage was an issue with the granular products, which would be especially important in light of the high bittercress population I had in my trial. I have seen good to excellent control of bittercress in earlier trials with Rout, Regal O-O, OH2, BroadStar, and Ronstar. Other products that gave unacceptable control include Kansel +, Barricade, and Regalkade.

In my postemergence trials, Goal, SureGuard, Image, Manage, Plateau, and Matrix gave essentially complete control. QuickSilver, Gallery, Basagran, Spartan, and Ronstar WP significantly reduced bittercress growth but did not provide the level control seen with the

previously-mentioned postemergence herbicides. Goal and SureGuard primarily fit conifer production. I am currently evaluating the potential for Manage (now called Sedgehammer) in nursery crops. More data on nursery crop tolerance is needed for the other treatments in my postemergence trial.

Control of bittercress is therefore easiest in conifers, where a number of preemergence (both sprayable and granular) as well as postemergence options are available. In most other woody ornamentals, Gallery would be a sprayable option for preemergence control, while the granular products such as Ronstar or Snapshot could also be used. Gallery could also be utilized for control of small bittercress plants. Bittercress control is most difficult in herbaceous nursery crops, where most of the broad-spectrum products cannot be used, and the dinitroaniline herbicides like Surflan and Pendulum do not provide complete control. Utilize Gallery or Snapshot in those herbaceous perennials where tolerance exists. Otherwise, sanitation and hand-weeding become more important for bittercress management in herbaceous plant production.

Recommendations for Bittercress Management

- Control bittercress in propagation and in gravel areas around containers
- Utilize a preemergence herbicide such as isoxaben (Gallery, Snapshot) where possible
- Hand-weed, reapply preemergence herbicides on a regular basis
- In dormant conifers, Goal or SureGuard provide postemergence control
- Gallery applied early postemergence is an option in certain other nursery species

Reprinted from VNLA News, March/April 2006.

**FORMULATION IMPACT ON
HERBICIDE PHYTOTOXICITY IN
CONTAINER MEDIA**

Jeffrey F. Derr, Weed Scientist, VA Tech

Dinitroaniline herbicides are widely used for weed control in container and field nursery production. This group includes the herbicides prodiamine (Barricade, Factor, RegalKade), oryzalin (Surflan), pendimethalin (Pendulum, Corral), and trifluralin (Treflan, Preen). They are the primary preemergence herbicides in production of perennials, and are the base product for weed control in woody nursery species. They also are components of broad-spectrum combination herbicides, including Rout, OH2, and Snapshot. Although they are widely-used in nursery production, growers still have concerns about phytotoxicity to their crops. Concerns are expressed primarily at root growth suppression, although stem development at the soil line is also of concern. Research by Ms. Lori Simmons and me has shown that the dinitroaniline herbicide pendimethalin leaches to a greater extent in a pine bark-based growing medium than in field soil. Thus, the potential for damage to crop root systems is greater in container production.

These products are generally available in sprayable, as well as granular form. Different sprayable formulations are available for certain chemicals. The type of formulation used may also impact leaching potential, thereby affecting crop tolerance, especially root development. Newly-developed microencapsulated formulations may respond differently in containers than emulsifiable and water dispersible granule types. Besides impacting nursery crop root development, these formulations may differ in their weed control properties. Formulations that leach to a greater extent would be expected to provide lower weed control, as well as a shorter length of residual control.

Through a grant from the Virginia Nursery and Landscape Association, we conducted trials to determine the importance of herbicide formulation on weed control and tolerance in pansy. We utilized various formulations of pendimethalin, including the emulsifiable concentrate (EC), the water-dispersible granule (WDG), the granular (2G), and the newest form, the microencapsulated Pendulum AquaCap. These formulations were compared to Snapshot and the sprayable formulations Gallery and Dimension EC. One container trial used established plants of the pansy variety 'Crystal Bowl Mixed'. In terms of weed control, the effectiveness of Pendulum formulations was EC>WDG>2G>AquaCap. In terms of flowering, pansy flower counts was 2G>AquaCap>WDG> EC. At the higher rates, Dimension, Pendulum EC, and Snapshot gave good to excellent control of common chickweed, annual bluegrass, and hairy bittercress. Other treatments gave lower control of one or more species. Herbicide injury did not show up until later in the trial, Pendulum EC and Dimension EC caused the greatest reduction in pansy flowering, with both herbicides reducing pansy flower count by 70% or greater. Pendulum 2G and Snapshot caused no reduction in pansy flowering in this trial.

In another trial, the pansy variety 'Universal Plus Beaconfield' was used. All treatments except Gallery significantly reduced annual bluegrass stand, with Dimension and Snapshot providing complete control. Most treatments except Pendulum 2G reduced pansy flower count and caused visible injury. Greatest reduction in pansy flowering was seen with Dimension and Pendulum EC, with both herbicides causing 80% or greater reduction in flowering. In this trial, Snapshot and Gallery reduced flowering in pansy, while these chemicals did not reduce flowering in the other pansy trial. Either there are varietal differences

in pansy response to isoxaben-containing products or some other factor such as environmental conditions at treatment caused the differences between the 2 trials.

In trials with azalea, we demonstrated that sprayable applications of pendimethalin can directly reduce shoot growth separate from any impacts on root growth. The results we observed in pansy are consistent with the azalea findings, since granular forms caused less injury than sprayable ones. The reduced flowering observed in pansy from sprayable formulations is probably due to foliar absorption and subsequent injury.

Conclusions/Recommendations

- Utilize granular dinitroaniline herbicide formulations in sensitive crops, especially in herbaceous species
- Sprayable formulations generally provide greater weed control than granulars, though, probably due to coverage issues
- Avoid overtop sprays of emulsifiable concentrate (EC) formulations in nursery crops
- Water-based and dispersible granular formulations cause less injury than EC forms

Reprinted from VNLA News, March/April 2006.

OUT OF BUSINESS

Look at this picture (*Editor's note: Obviously we don't have a picture next to this article—use your imagination*). Take a close look to the right of the doors. It's every business owner's worst nightmare: a 'Space Available' sign where there was once a working business.

Unfortunately, it happens all the time, and I'm not just talking theory here – there's an actual story behind this photo.

This now-empty store is right next to a Japanese restaurant my wife and I go to for dinner. About eight months ago, we went there to eat, and as we were walking back to our car, I noticed that a new home goods store had opened next to the restaurant. I made the mistake of actually mentioning this to my wife, and before I knew what was happening, she had turned around and was halfway across the street walking towards the store.

When we got inside, we both had the same reaction – 'They're going to be out of business in six months.' Here's why:

The store looked like a miniature version of a 'Bed Bath & Beyond' or 'Linens 'n Things' store. It had a lot of the same types of products as these larger stores, just a lot fewer of them, and in a much, much smaller space. But there was absolutely nothing special or unique about anything they carried.

Oh, did I mention that there actually is a Bed Bath & Beyond store not five minutes away in a strip mall with significantly more traffic?

Bottom line: there was nothing special about the store's location, about what they sold, and about how they promoted themselves. In other words, they were a commodity. A common, garden-variety, 'widget,' interchangeable with 50 other

identical widgets. And all other things being equal, people will buy a commodity where it's cheapest, where they can find the best variety, or where it's most convenient.

In discussing the concept of the Unique Selling Proposition (USP) in one of my live 'Outrageous Marketing' programs, I gave the example of this store, along with my prediction that it would be out of business in about six months.

One of the participants, in an blatant attempt to 'brown nose' the instructor and win one of the many prizes I give away, asked, 'If they brought you in to help with their marketing, what could you do for them?'

It was actually a very good question. I thought about it for a few seconds and then answered, 'Nothing. That store is doomed from the start.'

Fast forward to last Friday, when we went out to dinner at the Japanese restaurant with some friends. As we were leaving to walk towards the car, I glanced back over my shoulder to take a look at the store and saw what you now see in that picture: a 'Space Available' sign in the window, and bare shelves inside the store.

I felt bad for the owners - a young couple who had almost certainly invested their life savings in their 'dream' of owning a small home-goods store. But they violated one of the cardinal rules of marketing.

The only reason you should be in business – any business – is to offer something special to your customers. Something unique. Something uncommon. Something that sets you apart from everyone else in your market. And...something your customers truly need. Unfortunately, this store violated all of these requirements.

If you want to make a New Year's resolution,

then commit to looking at everything you offer in your marketplace and make absolutely certain that there's a clear USP that sets you apart from everyone else in your field.

Because I'd hate to see a picture of your business that looks like the one up above!

Ron Rosenberg shows businesses how to get more customers than they know what to do with and how to keep them for life.

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EVALUATING NURSERY IRRIGATION SYSTEMS: UNIFORMITY OF WATER APPLICATION

**Tom Fernandez, Dept. of Horticulture,
Michigan State University**

Water regulations have not hit Delaware but all nurseries should work to adopt practices that will improve water use efficiency. Improving irrigation efficiency and uniformity will also improve plant production and possibly reduce costs, and there are some very simple procedures that any nursery can do to evaluate and improve their irrigation systems. This article will discuss uniformity of irrigation water application.

It is important to determine the uniformity of irrigation systems since a higher uniformity of water application results in more similar delivery of water to all plants within an irrigation zone. Water use efficiency increases as water application uniformity increases.

Distribution Uniformity (DU) is a term used to express water application uniformity. The higher the DU, the more uniform the water application. A low DU, below 60%, indicates unequal distribution of irrigation water, while a high DU, over 80% indicates that water is applied fairly evenly to all of the plants in the irrigation zone. You should attempt to have your nursery's DU over 80%.

Testing DU of overhead irrigation systems is easy to conduct and requires no special equipment. All that you need is a minimum of 16 straight-sided catch containers and a ruler. As long as the cans are straight-sided, they can be of different types (width or height). You can use more than 16 cans but keep it in multiples of four, it will make the math easier.

Distribute cans evenly throughout the irrigation block to be tested. Run your irrigation system

for 1 hour. Measure the depth of water in each can and record it. The average application rate for this block is the sum of all of the depths divided by 16 or 0.8 inches/hour. To determine the DU, take the lowest ¼ of the measurements and take the average: $(0.6 + 0.6 + 0.6 + 0.7)/4 = 0.6$; DU equals the lowest ¼ of the measurements divided by the average application rate times 100: $(0.6/0.8) \times 100 = 75\%$.

Remember that we want a DU greater than 80% and our example has a DU of 75%. There are several factors that could cause a poor DU, some of which are easy fixes and others are more difficult. The easy fixes are:

1. **Inadequate irrigation system operating pressure for the nozzles being used.** Sprinkler heads come with pressure specifications regarding pattern and distribution, usually a fairly large range. If the pump is supplying too much or too little pressure, then the nozzles will not perform properly. Adjusting the delivery pressure at the pump will solve this problem. If the pump pressure has to be high to supply other irrigation blocks, in-line pressure reducers can be used and are inexpensive. If the pump pressure cannot be increased further, then the irrigation block is too large and can be split into smaller blocks.
2. **Improper selection of nozzles.** Instead of adjusting the pump pressure, different nozzles can be selected with pressure specifications that fit what the pump delivers. Also, all nozzles within a block should ideally be from the same manufacturer with the same distribution patterns (the same model).
3. **Changes in system components over time.** Nozzles wear out pumps become less efficient, pressure regulators fail. Proper

maintenance is essential and components should be serviced or replaced when they no longer meet specifications. Nozzles are the easiest and least expensive to replace and will change more rapidly than other system components. Find a nail or piece of wire that fits snugly into a new nozzle and check older nozzles to ensure that it still has a snug fit. As nozzles wear, the fit will become poor and the nozzles should be replaced. We will discuss pump and pressure regulators in future articles.

4. **Nozzle clogging.** Nozzles get clogged with a variety of objects, from stones to insects. Usually you can easily see what is clogging the nozzles and remove the item with a wire or take the nozzle off and clean it.
5. **In-line filters.** Some of the smaller overhead nozzles have filters just before the nozzle; clean these out regularly.
6. **Wind.** Irrigation systems should be designed with regard to prevailing winds. Increasing the overlap can increase DU for established systems that were not properly designed for prevailing winds.
7. **Improper selection of pipe diameters.** This is the most expensive mistake to remedy. Replacing above-ground pipe is relatively inexpensive but replacing buried pipe is costly. In some cases, minor changes in system design can solve the problem.

Testing DU is the first step in improving the overall efficiency of irrigation systems. The next article will discuss determining DU for microirrigation systems and future articles will be about overall system efficiency.

The preceding article was reprinted from The Michigan Landscape™, July 2006.

UNDERSTANDING THE MARKETING MIX: CREATING A RECIPE FOR SUCCESS

Phil Harwood

It has been said that the majority of money spent on marketing is completely wasted. While this may be an overstatement, we've all witnessed marketing efforts that failed to connect with us. Super Bowl commercials certainly come to mind but small businesses are just as guilty of spending lots of money on ineffective marketing campaigns.

The marketing dilemma is not whether or not to market, but how. After all, every business needs to market their products and services – it is not optional. In the long run, no business in a competitive environment can survive without marketing. The difficult question to answer is, “How can we make the most of our marketing investments?”

The Marketing Plan

One of the most important steps that a business can take is to create a marketing plan. A marketing plan forces a business to assess its internal and external environments. It assists with the development of goals and provides direction for the organization. Marketing plans may be developed formally by a team or may be simply decided upon by the person responsible for sales and marketing. Regardless, marketing plans are an important tool to generate business growth.

The marketing plan will only produce a satisfying result if it is consistent with overall strategic objectives. In addition, the marketing plan must be supported financially on a long-term basis. Finally, there must be a commitment to live and die according to the marketing plan from all levels of the organization. If any of these conditions are not

met, the marketing plan will likely be a waste of resources, time, and energy.

A marketing plan contains several components. The primary component is commonly known as the “marketing mix”. In this article, I will attempt to shed some light on this important marketing concept. As you will soon realize, there is more to marketing than one would think. My hope is that with a basic understanding of the marketing mix, you will be inspired to consider your situation, roll up your sleeves, and develop a marketing plan for your organization. In fact, taking on this project may be one of the most significant things that you do this year.

Many businesses – especially small and medium size ones – fail to create marketing plans. A primary stumbling block for many business owners and managers is lack of knowledge. Many aspects of marketing are complex and difficult to fully comprehend. It is human nature to avoid wrestling with things that don't come easy to us. Another stumbling block may be our own simplistic understanding of what marketing is. If we think we have the answers, we won't seek out more knowledge or ask for help.

If there isn't anyone in the organization with experience in this area, I would highly recommend that a considerable amount of research is conducted or a qualified marketing consultant is hired. A poor marketing plan is actually worse than not having a marketing plan. An ineffective marketing plan may squander precious resources, result in missed opportunities, confuse your customers, turn off potential customers, or even tarnish a business' reputation.

The Marketing Mix

The term “marketing mix” was coined by Neil H. Borden, a professor of advertising, to

describe the blending of various ingredients of a marketing plan¹. The marketing manager may be compared to a baker who experiments with different ingredients and quantities in order to find the perfect mixture. Borden's list of basic ingredients includes: product planning, pricing, branding, channels of distribution, personal selling, advertising, promotions, packaging, display, servicing, physical handling, and fact finding. The marketing manager's job, according to Borden, is to decide which ingredients should be added to the mixture and in what quantities.

Several other marketing mix models have been introduced over the years. One of the most famous was developed by E. Jerome McCarthy, a renowned professor of marketing. His model is referred to as the "Four P's" and consists of four elements of the marketing plan: product, price, place, and promotion². Because of the simplicity of the "Four P's" model, it will be used to provide the structure for the remainder of this article. As it turns out, Borden's 12 ingredients fit nicely into the "Four P's."

The "Four P's" model focuses on a specific group of customers called "target customers". These are the prime customers that the business is attempting to attract in order to meet its growth and profit objectives. To accomplish this, the "Four P's" must be in alignment with each other as well as with overall strategy. They should work in unison to attract target customers. This is the purpose of the marketing mix.

Product

The first ingredient in the marketing mix is product. Product is whatever you sell to your customers and includes all goods and services offered to the customer. Many businesses offer both goods and services, even though they may think of themselves primarily as a manufacturer,

wholesaler, retailer, or services form. For example, a retail garden center's primary business may be selling plants to homeowners. But they may also offer landscape design services, delivery services, installation services, or warranties. Each of these secondary services must be considered by the retailer when making product decisions.

Product also includes product planning, which encompasses marketing research, research and development, and product testing. These activities are focused on attempting to identify unmet needs in the market – where opportunities exist. Once these customer needs are determined, products and services may be developed or modified to meet these needs.

Many decisions must be made to develop a product offering. These decisions involve functionality, quality, branding, packaging, styling, repairs, warranties, safety considerations, etc. If a product or service qualifies for patent protection, the business will presumably enjoy a period of legal protection. However, in most cases, patent protection is not an option and the "first mover" advantage is relatively short in duration.

Products actually have a life cycle. Products are created, developed, mature, decline, and eventually become obsolete. Some products have a lengthy period of prime years, while others move quickly from birth to retirement, depending on many factors. Regardless, we all must be aware of where our products and services are in their life cycles. Of course, many of us are selling products and services with a lengthy life cycle and don't have to worry about such considerations on a daily basis. Nevertheless, we should remain vigilant about changes in our markets that will affect our livelihoods. For example, when VCR's first hit the market they were very expensive. The first buyers were tech-savvy people with plenty of

disposable income. As manufacturing capacity ramped up, prices fell, and eventually VCR's became as commonplace in American homes as TV sets. However, the digital revolution will soon force VCR's into obsolescence.

In the landscape maintenance industry, robotic mowers are being used today on a limited basis. Just think how the industry would change if zero-turn riding mowers were replaced by unmanned robotic mowers? Many of us smile when we walk by the robotic prototypes at the trade shows but will we be still be smiling if the industry is transformed by these machines and we're on the wrong side of the fence?

Accurate measurement of a product or service's success is essential for determining future product decisions. Without comparative sales and profit data, we will be at a severe disadvantage. The garden center should know the sales and profit margins of each product type and container size they sell. They should also be able to compare the sales and profits produced by each of its auxiliary services. With this information, they'll be able to make informed decisions about which products and services are winners and which are losers.

Price

Price is what you sell a product or service for. As simple as this may seem, there is much complexity involved with determining the correct prices and pricing strategy. In addition, there are many legal issues involved with pricing, with respect to discrimination and anticompetitiveness. There is a fine line between cooperation among competitors, which is legal, and collusion, which is illegal. In general, any pricing strategy which seeks to limit competition will not be looked favorably upon by government authorities.

Price decisions include establishing list prices,

quantity or payment discounts bundling, as well as overall pricing strategy. A primary decision is whether to establish linear or non-linear pricing. Linear pricing is simply having the same price for all customers, regardless of the quantity purchased or who the customer is. Non-linear pricing is establishing different prices for various quantities or different types of customers. Non-linear pricing strategies are obviously more complex than linear pricing schemes and they can be illegal in some cases.

Price equates to the total cost of ownership to the customer. For example, a 2-gallon perennial from the local garden center may only cost \$14.99 at the store. However, the total cost of driving to the store to buy it, time and additional materials required to plant and maintain the plant (soil amendments, fertilizer, water, mulch, herbicides, weeding, etc.). As you can see, the total cost of owning this perennial is ultimately much more than the original \$14.99 that was paid at the garden center. If the total cost of ownership is more than the perceived benefit derived from owning the plant, than the purchase will not be made.

So how does a business decide on what prices to charge? Many businesses begin by researching the competition's prices for similar goods and services. They assume that market forces have determined that these are the correct prices and establish their prices accordingly. Alternatively, many service businesses have a pricing strategy of "whatever the market will bear," which translates to "whatever a customer will pay". With this strategy prices may be established for each customer, depending on their unique requirements.

Microeconomic models exist which allow for quantitative analysis of optimal prices. The beauty of the mathematical models is that they eliminate the trial and error process and make it possible to determine the best price to charge in

order to maximize profits, which is the ultimate goal in most cases. All too often, prices are set too high or too low, resulting in less than optimal profitability.

Pricing decisions must be consistent with overall strategic objectives. If a business is new in a market, it may seek to “buy” market share by setting their prices slightly lower than the established competitors. Alternatively, a business may set prices higher than its competitors in order to support its claim to be a premium provider. Prices do tell a story and the story needs to be consistent for it to be credible.

Place

Place is where you sell your products and services. It includes the various methods employed to get the product or service from your business to the customer. It encompasses channels of distribution, handling, warehousing, transportation, intermediaries, order processing, etc. These logistic management issues impact the way the product or service is sold or delivered to the customer. Place decisions may affect a business’ image as well as its cost structure.

Place decisions should be consistent with overall strategy. For example, if Starbucks[®] coffee was available at McDonald’s[®], it is likely that its brand image of high quality would suffer. The sales channel should be consistent with the brand image. Another place example from Starbucks[®] is regarding their sales of CD’s at their coffee shops. This creative distribution channel has been very successful because it fits perfectly with their strategy of creating hip places for people to decompress and enjoy a great cup of coffee and a snack.

Businesses often have a narrow viewpoint when it comes to place, focusing exclusively on their immediate customer. However, it is wise to not

lose sight of the needs of the end user. For example, a grower of bedding plants needs to be aware of changes in consumer buying habits, even though their immediate customer is a garden center or broker. The retailer may be paying the fare, but the end user is driving the bus.

Place decisions may also be highly effective at “telling the story” to customers. The manner in which a product or service is delivered speaks volumes. A car carrier rolling down the highway with a load of sub compact cars is showing the focus on value. The cars may be uncovered, dirty, and stacked up two high, but the reduced transportation cost is very important. On the other hand, a truck carrying a single luxury car shrouded with a secretive protective covering speaks to the quality of the brand image. The luxury car is one of a kind, not to be herded with the masses, and must be handled with special care. Even the transportation is telling the story. This is place.

Promotion

Promotion is how you go about creating interest and selling your goods and services. This area is so diverse that a “promotions mix” has been developed. Promotion includes advertising, sales promotion, direct marketing, personal selling, product display, etc. Optimal results are often achieved by utilizing several promotional methods simultaneously.

Promotional efforts are only effective if directed toward the target audience, have a compelling message, and utilize a proper form of media. Promotional campaigns may miss the mark if directed toward the wrong audience or too general of an audience. For example, a commercial landscape contactor may not find it cost-effective to advertise in a major metropolitan newspaper. While their customers (facility managers) may read this newspaper,

they only comprise a tiny fraction of the readership. The rest of the newspaper readers are not target customers. However, if the landscape contractor were to run the same ad in a facility management trade publication, the results may be superb.

One important promotion decision involves whether to follow a “push” or “pull” strategy. A “push” strategy is directed at resellers and attempts to create incentives to “push” the products or services through the distribution channel. A “pull” strategy is directed at the end users and attempts to increase demand, which will “pull” increased products or services through the distribution channel. A grower with a “push” strategy may offer volume discounts to a retailer. If the grower were to use a “pull” strategy, they may run ads for bedding plants in the local newspaper to create interest in gardening.

Promotions may be measured to determine their effectiveness. Some promotions are easier to measure than others; however, an effort should be made to assess the successful news of every promotional campaign. A return on investment comparison will be extremely useful when making future promotion decisions. At the same time, promotions should be seen as long-term investment. It takes time and regular promoting to gain traction in the marketplace. The worst thing a business can do is to give up on a promotional campaign too early and lose the momentum that it has been building.

Summary

Despite the fact that each of our businesses is unique, we all share four things. We sell products and services. We set prices for these products and services. We have a way to get these products and services to our customers. And, we promote our products and services. It is the mixture of these ingredients that makes us

all different.

The savvier we are with our “marketing mix” the more traction we will have in the market. The story that we are telling to our customers will be more consistent, more in tune with their needs and produce more sales at higher margins. This is truly a “recipe for success”.

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¹ Borden, N. (1964) “The concept of the marketing mix”, *Journal of Advertising Research*, volume 4, June, 1964, pp 2-7

² McCarthy, J. (1960 1st ed.), *Basic Marketing: A managerial approach*, 13th ed., Irwin, Homewood IL., 2001.

The preceding article was reprinted from The Michigan Landscape™, July 2006.

A REVIEW OF WEED CONTROL PRACTICES IN CONTAINER NURSERIES

L.T. Case, H.M. Mathers, and A.F. Senesac

Editor's note; This article reviews some current weed control methods, problems associated with these methods, and possible strategies that could be useful for container nursery growers. The first portion of this article appeared in DNLA News Volume 20, Issue 3, Winter 2005 and the second portion appeared in DNLA News Volume 21, Issue 1, Spring 2006. The following is the final section focusing on environmental issues associated with herbicides.

Factors affecting herbicide activity and fate in the environment

Five factors influence herbicide activity and therefore herbicide choice. First is the influence of microbial breakdown. Most herbicides are broken down by microbes at some point in time. Herbicide chemical structure determines the ease and rate of its breakdown by microbes. Microbes "eat" what is more available and easy for them to break down, which are usually things like fertilizers and organic matter. Some herbicides like 2,4-D decompose quickly, with an average half-life of 10 d. Compounds like diuron and atrazine are more resistant to microbial breakdown and can persist longer than one year; degradation rate is highly dependent on the pH of the soil. Repeated applications of the same herbicide can lead to a buildup of microbes that are particularly good at breaking down that herbicide, which can lead to a decrease in residual activity.

Secondly, adsorption influences herbicide activity and refers to the chemical and/or physical attraction of a substance to a surface. Soil organic matter content and pH have a profound impact on adsorption. The high organic matter content found in soilless

container mixes has tremendous adsorptive capacity. Herbicide adsorption depends to a great extent on the herbicide chemical properties. Dinitroaniline herbicides are strongly adsorbed to nursery mixes with normal pH.

The third factor is leaching, the movement of a herbicide in solution through the soil. Although non-target loss is the largest contributor of herbicide runoff, leaching also comes into effect. Groundwater contamination and herbicide runoff into recirculation ponds have increased the nursery industry's awareness of an herbicide's leaching potential. About 7.3% of the total amount of isoxaben applied was found in runoff water from a spray application within 8 d of application. Leaching ability of a particular herbicide is dependent on the water solubility of the chemical, porosity of the media, and the affinity of the media to adsorb the chemical. Leaching ability is also affected by amount of irrigation/rainfall immediately after herbicide treatment and foliage (the crop canopy affects particle placement). A study using radio-labeled oxadiazon found that 5.4% of the chemical could be leached in a 5-d period after it was applied to container plants. Leaching of simazine and metolachlor was most severe with a 3:1 redwood bark: sand medium. Recent studies have indicated that the application of preemergent herbicides onto organic mulches reduced herbicide leaching by 35-74% compared with bare soil preemergent herbicide applications, probably because of increased adsorption by the organic content of the mulch.

The fourth factor that affects herbicide activity is volatility, the tendency of the herbicide to change from a solid or liquid to the gaseous phase. Some herbicides can volatilize and are lost to the atmosphere. Some examples of volatile ornamental herbicides trifluralin (a dinitroaniline herbicide) and oxyfluorfen. Examples of postemergent herbicides that are

highly volatile are growth regulators such as 2, 4-D or dicamba. Some herbicides such as atrazine and imazaquin, are not considered volatile compounds; however, they can evaporate over a period of time, if hot and dry conditions prevail. Volatile herbicides are lost more readily from moist soils than from dry soils. If sensitive species are in proximity to the volatile compounds they can be damaged. When using volatile herbicides, one should take more caution with environmental factors like heat, wind, and humidity.

The final factor is photodecomposition. Many herbicides are not highly susceptible to photodecomposition, but it can occur over time and can be an issue in container production where herbicides can be exposed on the media surface for longer periods of time than in field culture. Dinitroaniline herbicides like trifluralin, oryzalin, pendimethalin and prodiamine are susceptible to photodecomposition. Oxyfluorfen, another common container preemergent herbicide, is also susceptible to photodecomposition.

Problems associated with herbicide use in container production include proper calibration, herbicide runoff concerns from plastic or gravel (especially when chemicals fall between containers), and the need for multiple applications. Frequent reapplication is necessary to maintain acceptable weed control in containers, so it is likely that the adsorption and half-life of herbicides on the surface of a soilless media is less than those observed in field soils. Off-site movement of herbicides through leaching, runoff, and spray drift is a concern facing nursery growers. As much as 80% of a granular applied herbicide can be lost by non-target losses, depending on pot spacing. There were only slight differences in herbicide losses depending on crop species present. Non-uniformity is also a concern when applying herbicides. Property trained personnel and

calibrated and well-maintained equipment can reduce non-uniformity. Growers also need to be aware of the best procedures and techniques to apply herbicides to reduce the loss from non-uniformity and misapplication. Extension agents should be aware of these procedures and teach them to the growers. Possibly the biggest problem with herbicide use is human exposure and environmental issues.

Within the last 10 to 20 years, environmental fate of herbicides has become a major issue. Even though many health tests are required for registration of a pesticide by the U.S. Environmental Protection Agency (EPA), the potential long-term human toxicological effects of herbicides are not fully understood, and probably never could be because of the complexities between bodily processes and pesticides. However, we can estimate herbicide acute and chronic toxicities to humans through the use of laboratory animals. Oxadiazon, a common nursery herbicide, is likely to be an oncogen (i.e., a substance that can cause the production of tumors), and has slight to moderate acute mammalian toxicity. Many environmental fate studies have been conducted with herbicides in agronomic crops. Few studies, however, have been conducted on herbicide fate in the nursery area. EPA requires extensive reporting from laboratory and field studies about the environmental fate of new pesticides. The Food Quality and Protection Act of 1996 also requires that old pesticides be re-registered.

Pesticides applied to containers can be lost through misapplication or by leaching of the pesticides out of the bottom of the pot. Containment (or recirculation) ponds catch much of the runoff from rain and irrigation water, which may hold herbicide residue. Recirculation ponds are ponds that are used to irrigate the nursery area and designed to catch 90% of the water after each irrigation event and

a maximum of 40% of irrigation water from multiple applications. These ponds can catch some of the herbicides that are lost due to leaching and misapplication. This is of concern since the herbicides present in the ponds could be phototoxic to some of the crops when they are irrigated with the water from the ponds.

Reducing herbicide runoff

Herbicide losses from containers used in ornamental horticulture can be reduced by effective management strategies and with new, innovative ideas. Some ideas have been implemented and used by nurseries; some have not. One way, of course, is to implement hand weeding as the primary method of weed control; however this is quite expensive compared to chemical control. As previously mentioned, non-target loss is a major contributor to herbicide runoff. Reducing pot spacing when applying herbicides can reduce herbicide loss.

Herbicides have been combined with different “carriers” to (1) reduce the amount of herbicide applied; 2) to enhance and/or extend efficacy; 3) to increase environmental and ecological safety; and, 4) to avert some current label restrictions. Controlled released fertilizers coated with oxadiazon were effective at suppressing prostrate spurge and large crabgrass. A dicalcium phosphate tablet coated with propachlor, alachlor, naptalam, or chloramben provided good weed control when the right number of tablets were placed in the right sized containers. The tablets released a small amount of herbicide whenever water was applied. In a larger study, surfactants were added to the tablets containing one of the following: metolachlor, isoxaben, oryzalin oxadiazon or oxyflourfen. The best combination was oxyflourfen +X-77 (United Agri Products, Greeley, Colo.), and the area of weed inhibition was further increased up to 15 cm around the tablet. When chlorsulfuron and

triasulfuron were impregnated into double ammonium phosphate fertilizer, the control of henbit (*Lamium amplexicaule*) and bush wallflower (*Erysimum repandum*) was as good or better as the directed sprays of the herbicides, depending on herbicide and weed species.

One idea researched by Mathers involved combining herbicides with mulches. The thinking was that the herbicide would absorb to the mulch, causing the herbicide to be released slowly into the soil or media. This, in turn, would decrease the amount of herbicide needed and reduce the amount leached from each pot. Mathers compared the efficacy of various mulches to herbicide-treated mulch that was most effective in the previous study was Douglas fir (*Pseudotsuga menziesii*) nuggets treated with oryzalin. Mathers found that the herbicide-treated Douglas fir increased and extended efficacy and reduced phytotoxicity compared to the herbicides applied alone, and speculated they would help reduce herbicide movement and non-target losses. Cultural control and chemical control can be used simultaneously to control weeds. More research is needed in this area, because the evidence presented here indicates herbicide residual can be extended and weed control increased. There are also possibilities of using herbicides that are not normally used with nursery crops. Acetochlor, when combined with pine nugget or hardwood, is not injurious to ‘Care Free Beauty’ rose (*Rosa* spp.) or ‘Green Gem’ boxwood (*Buxus* spp.), and hardwood combined with acetochlor is only slightly phytotoxic to ‘little Princess’ spirea (*Spirea* spp.).

Herbicide technology and research

There are many herbicides, herbicide manufacturers, and many crops in the nursery/ornamental industry. One can see that there is always research to be done, especially with the large amount of species. Interregional

Research Project #4 (IR-4) was established in 1963 to obtain regulatory clearances for crop protection chemicals on specialty food crops. Nursery, floral, Christmas trees, forestry, and turf crops were added to the program in 1977. Many herbicides are now registered for ornamental crops through the IR-4 program. IR-4 is administered by the U.S. Department of Agriculture and Cooperative State Research Education and Extension Service. A pesticide is registered for a specific crop after pesticide's manufacturer deems there is enough data to support the registration; the data comes from the collaborative efforts of many researchers (mostly from universities) across the nation.

Potential new pesticides are one research focus of many pesticide manufacturers, and there are usually new chemicals every year. Many of these chemicals go through the IR-4 program for ornamentals due to the extensive amount of species. Chemical companies cannot afford to test each species. Although new chemicals cost a lot of money to register, the monetary gain by the manufacturer and growers (indirectly by using the pesticide) is a huge incentive for companies to look for new chemistry. New formulations to existing herbicides are also researched. Many herbicides are now being micro-encapsulated by the manufacturer to improve residual [e.g., Pendulum Aquacap (BASF, Research Triangle Park, N.C.) and Degree (Monsanto Corp., St. Louis)]. Also, whenever a new chemistry is found, many types of formulations (e.g., wet-table powder, granular, emulsifiable concentrate, etc.) are researched, along with herbicide concentrations in each formulation.

Glyphosate-tolerant crops are now quite extensive, ranging from glyphosate-tolerant soybeans to glyphosate-tolerant bentgrass (*Agrostis stolonifera*), which is approved for use as animal feeding. As already stated, glyphosate tolerance (or resistance) in weeds is not

desirable, however, in crops, this can be highly desirable because of the wide range of weed control that glyphosate can give. Glyphosate tolerance in the most desirable crops would be one way of postemergence control of problem weeds. Glyphosate is also relatively cheap in comparison to many preemergence herbicides, so this would save growers much money directly and indirectly (e.g., only applying glyphosate where it is needed). Crops have been genetically altered for other herbicides also, such as glufosinate and imadizolinone herbicides. Glyphosate tolerance is just one of the possibilities. Although there is some worldwide concern on genetically modified crops, these do present a very wide field of research for nursery crops.

Conclusion

Controlling weeds is an important aspect of container nurseries. Weed scouting, using good sanitary methods, sprayer calibration, and herbicidal knowledge are key points in starting a weed control program. Other points to consider when controlling weeds are worker safety, the environment, and economical costs of the program. Using the correct herbicide at the right time while reducing herbicide loss to surface water, recirculation ponds, etc, will be economical for the nursery and will also be environmentally friendly. Keeping up with new advances, technology, and herbicides will also be advantageous for the grower. With the increasing amount of concern for the environment and the reduction of new herbicide registrations, there is a continued need for new ideas and innovations to control weeds, although the suggestions presented in this paper could resolve some of the issues.

Excerpted from HortTechnology – July-September 2005, 15(3).

**LETTER FROM RODALE
INSTITUTE ON AERATED
COMPOST TEA**

June 12, 2006

The purpose of this letter is to inform you of our recent findings on the subject of using aerated compost tea (ACT) for plant disease suppression purposes. As you may be aware there is increased interest and information needed for answering grower questions on the use of ACT for plant disease suppression. With over 60 years of experimenting with compost, The Rodale Institute® has been interested in evaluating ACT use as a plant disease suppression tool. In previous research, we along with others have found that passive compost tea can provide suppression of certain plant disease in some cases. Passive compost tea is often made by steeping a burlap sack in water for an extended period of time at a ratio of 1 part compost to 5 parts water.

In recent years, ACT has become increasingly touted as a safe and effective biologically based disease suppression product. Aerated compost tea is different than passive compost tea as it involves supplying oxygen and nutrient additives to accelerate the process and depends on aerobic rather than facultative anaerobic microorganisms. An entire industry has grown and bloomed around claims supporting health benefits from ACT.

For the past two years, The Rodale Institute has been experimenting with compost tea as part of a research and education project funded by the Northeast Sustainable Agriculture and

Research and Education (SARE) program. Field experiments with grapes, potatoes, and pumpkins tested the efficacy of compost tea on suppressing crop diseases.

Although our initial work plan was to work with the extension community to promote the use of ACT, after extensive field testing we were not able to duplicate the plant health benefits suggested by ACT proponents. As such at this time, we cannot justify recommending the use of ACT for grower practice, based on erratic and low efficacy from several field trials we experienced.

On the other hand, we did find measurable crop responses to ACT about half of the time suggesting it might warrant further study particularly when combined with other more efficacious biologically based management treatments.

More information on our ACT research can be viewed on The New Farm® website at www.newfarm.org/ct. The link also includes a forum to submit questions or comments.

Sincerely,



Paul R. Hepperly Ph.D., Research
Manager
The Rodale Institute
611 Siegfriedale Road
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URBAN PESTS IN THE NEWS:

Susan Whitney
University of Delaware

Cicada Killers

I've started getting calls from people being buzzed by Cicada Killers! Females of this large wasp dig a burrow, sting cicadas to paralyze them, carry them to the burrow & lay an egg on the paralyzed cicada. When the egg hatches, the cicada killer larva eats the paralyzed cicada thereby protecting trees from cicada damage next year. The female is oblivious to humans -- she is frantically hunting cicadas, but she might sting a cat or dog that got too curious. Females are active during July & August, then die.

The male does not sting (no ovipositor), he defends the burrow and chases away predators. He is all bluff and cannot hurt humans. Yes, the mound of soil around the burrow may ruin the look of well-groomed turf. I tell homeowners to plant ground cover -- next year's females will avoid this area.

I've added a fact sheet from Kentucky to our list of fact sheets at:

<http://ag.udel.edu/extension/pesticide/pestfactsh eets.htm> . From this page, you can go to: <http://www.uky.edu/Ag/Entomology/entfacts/mi sc/ef004.htm> .

Bed Bugs

It seems that there are lots of Bed Bugs in Delaware. This is not a sanitation problem. Bed Bugs move with humans. They are extremely difficult to control. I've added a fact sheet to our list of fact sheets. This link will take you to:

<http://www.uky.edu/Ag/Entomology/entfacts/str uct/ef636.htm> . Why are Bed Bugs exploding? Most of us think it is because we no longer do broadcast sprays for cockroaches anymore. The good news is that Bed Bugs carry no human diseases.

Brown Recluse Spider

One specimen of this spider was brought into Entomology & Wildlife Ecology this month from a residence in Newark. It was positively confirmed by Dr. Mark Lacey. If you would like to see it, let me know. We are in the process of working with the Pest Control Company charged with the treatment to determine if this is an isolated individual or a reproducing population. Brown Recluse spiders are not known east of Tennessee/ Kentucky. This is the second record for Brown Recluse in Delaware. The first, in 1982, was found at Dover Airforce Base and confirmed by Dewey Caron. No more specimens were found in Dover. You may have heard that Delaware Doctors have patients that have been bitten by Brown Recluse and vets say Brown Recluse are "everywhere." If this is true, then we need to see the specimens. We have no Brown Recluse in the Reference Collection at UD, in spite of many years of entomologists collecting arthropods. Of all the spiders that have been brought in for identification, none have been Brown Recluse. There are other causes for non-healing wounds on patients and the spiders the vets hear about may be the yellow sac spider -- another dangerous spider. If you get requests to ID spiders, let me know.

I've added a link on the Brown Recluse to our list of fact sheets that will take you to: <http://dermatology.cdlib.org/DOJvol5num2/spec ial/recluse.html>. Note that the correct pronunciation is re-CLUSE (as in reclusive), not REC-luse.

Rabies reported in Newark

We have a link on our list of fact sheets that will take you to: <http://ag.udel.edu/extension/horticulture/pdf/hyg /hyg-40.pdf>

Pesticide Update

Proposed Phaseout of Pesticide Azinphos-Methyl and Longer Restricted Entry Intervals for Phosmet

To increase protection for farm workers and the environment, EPA is proposing to phase out the remaining uses of azinphos-methyl (AZM). Use on almonds, Brussels sprouts, pistachios, walnuts, and nursery stock will be phased out by 2007, and use on apples, blueberries, cherries, parsley, and pears by 2010. During the phaseout, EPA is proposing additional restrictions, including reduced annual application rates, additional worker monitoring, and larger buffer zones to help minimize risks. The Agency expects growers of these crops to successfully adopt and transition to the available safer alternatives. All other uses of this pesticide have been voluntarily cancelled by the manufacturer.

EPA is also seeking comment on lengthening the Restricted Entry Intervals (REIs) for nine phosmet uses. The Agency is proposing these additional restrictions to mitigate potential risk to farm workers.

Both AZM and phosmet are organophosphate (OP) insecticides and are alternatives for one another in many instances. While AZM provides important pest control benefits to growers of apples and other crops, it poses potential risks of concern to farm workers, pesticide applicators, and aquatic ecosystems. The risk of concern for phosmet is for workers reentering treated areas.

These steps are being taken as part of an ongoing reevaluation of existing pesticides. The Agency has carefully considered grower impacts and ecological and worker risks based on new data and information. EPA is publishing this proposal and inviting public comments for 60-days before issuing a final decision. The Federal Register notice is available on EPA's Web site at

[EPA's FR Notice posting]. Comments may be submitted electronically at <http://www.regulations.gov> in docket number EPA-HQ-OPP-2005-0061 for AZM and docket number EPA-HQ-OPP-2002-0354 for phosmet. For additional information on AZM, please visit www.epa.gov/pesticides/op/azm.htm. More information on phosmet is available at www.epa.gov/pesticides/op/phosmet.htm.

[Final version of National Pesticide Use Database](#)

The Crop Protection Research Institute, the research arm of CropLife Foundation, has released a complete and final version of its National Pesticide Use Database. NPUD is the only comprehensive and publicly available source of pesticide use data in the U.S. The database now contains 16,409 new records of insecticide, fungicide, herbicide, and other pesticide use listed by crop, state, and active ingredient. NPUD is sponsored by USDA's Office of Pest Management Policy, EPA's Office of Pesticide Programs, USGS's National Water Quality Assessment Program, and CropLife America member companies. http://www.croplifefoundation.org/cpri_npud2002.htm

Registration now open for the 2006 Northeastern Region Pesticide Safety Education Center Workshop September 11-13, 2006, Days Inn, State College, PA

The Penn State Pesticide Education Program is pleased to announce the second annual Northeastern Region Pesticide Safety Education Center Workshop in partnership and cooperation with the Pennsylvania Department of Agriculture and the Environmental Protection Agency (EPA Region III and EPA Headquarters). The workshop will be held in State College, Pennsylvania beginning on Monday, September 11, 2006 at 1:00 p.m. and concluding the afternoon of Wednesday, September 13, 2006. The workshop is modeled

after a successful program in the southern region, hosted by North Carolina State University. The overall goal of the program is to demonstrate and provide participants with new interactive training presentations that they can then use for their own pesticide safety education programming. Hands-on training activities will be a major thrust of this training program.

No registration fee will be charged for attending the 2006 NEPSEC Annual Workshop and most other expenses (hotel and most meals) will be provided during the conference ONLY IF you attend the entire conference. However, participants will be responsible for their own travel costs to and from University Park. Registrations for this workshop are now being accepted. However, please keep in mind that, in order to provide the most hands-on experiences for participants, only 50 registrations will be accepted. Participants will be selected based on the order in which registrations were received.

For additional information and to register for this workshop, please visit the NEPSEC web page at: <http://nepsec.psu.edu/>. Please check out the Past Workshops page, which links to the 2005 agenda and comments and photos from almost all of the sessions.

Research Briefs

Propagation:

Improving overwinter survival in stem cuttings of *Viburnum dentatum* ‘Chicago Luster’. Some taxa are easy-to-root from stem cuttings, but die during the winter. This study found that treatments that promote active growth at the time of cutting harvest improved overwinter survival. By decapitating stock plant shoots, axillary shoots were in active growth at the time of cutting harvest. Those shoots continued to grow during the propagation phase, and the rooted cuttings survived late-season transplanting and had high overwinter survival. In cuttings of conventional form (without growing axillary shoots), incorporating controlled release fertilizer in the rooting substrate increased the rate of shoot flushing, subsequent shoot growth and overwinter survival. (P.J. Wilson and D.K. Struve)

Excerpted from J. of Environ. Hort. 24(1):6-12. March 2006.

PGRs increase propagule formation in *Hemerocallis* spp. Bare root production of *Hemerocallis* is accomplished in the field with crown division, but the number of propagules obtained is relatively low, only a few plants per mother plant. Results from this study showed that application of the seaweed extract/PGR mixture (0.10% ABA and 0.05% BA), Cycocel or BA increased the number of plants producing two divisions compared to control plants. These results have economic implications for bareroot production, which need to be verified on a larger field scale. In a commercial field, plant density is about 150,000 plants/ha. In 2003-04, *Hemerocallis* ‘Happy Returns’ sold for \$1.60/each (Balamore Farm Ltd. Catalog). If the proportion of plants producing two divisions can be increased from 70% to 100%, as seen

after the application of the PGR concentrations, this can potentially generate \$480,000/ha: an increase of \$72,000/ha as compared to a system without PGR application. The cost to apply PGRs is about \$100/ha, low compared to the financial returns due to these treatments. (M. Leclerc, C.D. Caldwell and R.R. Lada)

Excerpted from HortScience 41(3):651-653. June 2006.

Container production:

Container size and initial trunk diameter affect growth of container red maples. Data from this study showed that more growth occurred with smaller tree liners in a one year production system as compared to liners that were initially larger at potting. In fact, the smaller liners were similar in size after two growing seasons to the liners that were initially larger at potting. Container size strongly influenced growth and performance during the second growing season. One-inch caliper red maples were too large for a #7 (26.5 liter) container. These plants were smaller and quality was poorer when compared to plants grown in larger containers. Larger containers have substantially more root volume (60% less root volume in a #7 container than a #15 (56.8 liter) container). American Standards for Nursery Stock recommendations for a 1 inch caliper tree in a #7 container may need revision, since such a tree will not be of the highest quality. (D.C. Fare)

Excerpted from J. of Environ. Hort. 24(1):18-22. March 2006.

Greenhouse production:

Nutrient release from controlled release fertilizers (CRF) in an acid greenhouse substrate. Nutrient release from all the CRF's tested (Osmocote, Nutricote, Pylon and

Multicote) may be in excess of plant requirements during the first half of the production period but insufficient during later stages of production, depending on the nutrient demands of the crop being grown and the temperature profiles during production. From an environmental perspective, risk of water impairment when using the CRFs employed in this study would be greatest during the first 20 weeks of crop production. (D.J. Merhaut, E.K. Blythe, J.P. Newman and J.P. Albano)

Excerpted from HortScience 41(3):780-787. June 2006.

Preplant bulb soak with Topflor controls hyacinth height. Preplant bulb soaks of Topflor (flurprimidol) is a suitable height control option to prevent postharvest stretch of hyacinths. Growers have the flexibility of treating either the day of or up to 7 days in advance of potting; can soak the bulbs between 2 and 40 minutes; and reuse the solution with at least 100 bulb/L (at which time the solution will need to be replenished) and still achieve a similar degree of height control. Solution temperature does not need to be monitored (as long as tap water is $>$ or $=$ 16 C) and adequate height control is provided whether the entire bulb, just the top, or just the bottom of the bulb is submerged for the full duration of the soak. Acceptable height control was not obtained with higher concentrations of Topflor when bulbs were held for extended cold treatment before forcing therefore; staggered planting dates should be used. The problem of disposing the residual solution can be overcome by applying the solution as a substrate drench on another crop. (B.A. Krug, B.E. Whipker and I. McCall)

Excerpted from HortTechnology April-June 2006 16(2):370-375.

Substrate drench controls growth of 'Blue Champion' Exacum. Topflor substrate

drenches were more consistent in controlling plant height and diameter of 'Blue Champion' exacum with less plant-to-plant variation than Topflor foliar sprays. Topflor substrate drenches may offer an economic advantage to producers because the amount of chemical required is up to eight times less than recommended for Bonzi. (B.E. Whipker, I. McCall and B.A. Krug)

Excerpted from HortTechnology April-June 2006 16(2):354-356.

Reducing the height of Paperwhite narcissus with root-zone alcohol. This study showed that homeowners could plant bulbs in a normal hydroponic setting and allow initial root growth in water. After 7 to 10 days (more precisely, when plants are rooted, and new growth is 4 to 6 cm above the bulbs), the water could be poured off and replaced with 4% to 5% alcohol. The alcohol source is widely flexible (gin, whiskey, rum, tequila or vodka) but beer and wine are not suitable. Toxicity begins between 5% and 10% ethanol. Dilute root-zone ethanol solutions reduce excessive leaf and flower stem elongation when forcing paperwhite narcissus in the winter. (W.B. Miller and E. Finan.)

Excerpted from HortTechnology April-June 2006 16(2):294-296.

Landscape:

Differences in reproductive potential among Japanese barberry cultivars. While Japanese barberry (*Berberis thunbergii*) is an acknowledged invasive plant naturalized throughout the eastern and northern U.S., the danger posed by its popular horticultural forms is unknown and controversial. Genotypes of Japanese barberry separate into two general groups: 1) the large-growing purple-leaf forms var. *atropurpurea* and 'Rose Glow', which produced high levels of fruit/seed production

and seedling vigor; and 2) the smaller less vigorous cultivars 'Aurea' and 'Crimson Pygmy', which exhibited fruit/seed production and seedling vigor that were significantly reduced. Although these results alone cannot be used to assess the culpability of individual cultivars in contributing progeny to invasive populations, they do provide evidence that not all barberry genotypes possess the same baseline reproductive and progeny growth potential. (J.M. Lehrer, M.H. Brand and J.D. Lubell)

Excerpted from HortScience 41(3):762-767. June 2006.

Nursery fertilization impacts landscape performance of crabapple. Increased nitrogen concentrations of trees in the nursery can increase tree growth in the landscape, however, trees subjected to higher fertilizer rates in the nursery showed decreased drought stress tolerance and supported greater insect growth once they were in the landscape. Decreased stress tolerance may be a result of the lower root:shoot ratios and decreased concentrations of naturally-occurring defensive chemicals in trees grown at high fertility compared to trees grown with less fertilizer. While trees grown in favorable nursery conditions may be more susceptible to stress in the year following transplant, this effect appears to be temporary until the trees acclimate to their new growing conditions. (J.E. Lloyd, D.A. Herms, M.A. Rose, J. Van Wagoner)

Excerpted from HortScience 41(2):442-445. April 2006.

Heat-expanded slate and fertility requirements for green roof substrates. Moderately high levels of heat-expanded slate (up to 80%) can be incorporated into a green roof growing substrate when growing succulents, such as stonecrop, without sacrificing plant health and at the same time

reducing the load placed on the building. Non-succulents require deeper substrates, additional organic matter, or supplemental irrigation. Deeper substrates are beneficial for both increased water-holding capacity and as a buffer for overwintering survival. In general, plants that received no fertilizer produced the least amount of growth, but the three nonsucculent native species exhibited higher survival rates when they were not fertilized. Some fertilizer is necessary to maintain plant health when grown in a typical green roof substrate, although the amount required is minimal—possibly less than 50 g/m² per year. (D.B. Rowe, M.S. Monterusso and C.L. Rugh)

Excerpted from HortTechnology July-September 2006 16(3):471-477.

Insect Control:

Two spotted spider mite populations and control by predatory mites on impatiens impacted by watering practices. Two-spotted spider mite (TSM) infestations and injury on impatiens can be reduced by overhead irrigation (irrigations systems that wet plant foliage). However, predators still reduced TSMs even though overhead irrigation had a suppressive effect on predatory mites (PMs). Predators are particularly useful for reducing TSM injury when plants are watered infrequently. Overhead watering could be used in tandem with biological control as a component of an integrated crop management program for TSMs in ornamental greenhouses by rapidly lowering TSM population levels in hot spots before PMs are released. (G.P. Opit, G.K. Fitch, D.C. Margolies, J.R. Nechols, and K.A. Williams)

Excerpted from HortScience 41(3):691-694. June 2006.

Insecticides for thrips control on gerbera in greenhouses. Plants treated with 1x or 4x Avid

or Conserve were of the highest quality due to no phytotoxicity and not thrips damage. The control plants and plants treated with 1x Talstar had reduced quality due to thrips feeding damage but no phytotoxicity occurred. Plants treated with 4x Orthene were of the lowest quality due to extensive leaf chlorosis from phytotoxicity. Plants treated with 4x neem oil (Triact) had reduced growth. (J.D. Spiers, F.T. Davies Jr., C. He, C.E. Bogran, K.M. Heinz, T.W. Starman and A. Chau)

Excerpted from HortScience 41(3):701-706. June 2006.

Japanese beetle control on zinnia. Japanese beetle abundance was consistently lowest on plants treated with CX-8012 (high rate)—new product registered for insect control in Europe that is reportedly soft on beneficials—and Astro compared to the other products and the control. When Japanese beetle pressure is high, growers can expect some level of damage even with the most effective insecticides. Another product reported to give good control of Japanese beetles is Merit, applied as a soil drench. Merit kept *Tilia cordata* damage under 10% with a single soil application in 2005 and control lasted the whole season. Merit will carry into foliage but not necessarily into flowers. (S. Gill, P. Shrewsbury, S. Klick and S. Wadkins)

Excerpted from GrowerTalks, June 2006.

Effect of miticides for two-spotted spider mite control on predatory mites. Both rates of Pylon (1x and 2x) and Judo and a single rate of Floramite were not harmful to *Neoseiulus californicus*. However, these same miticides were toxic to *Phytoseiulus persimilis*. These laboratory studies may not indicate the way the miticides and predatory mites would behave under greenhouse conditions. (R.A. Cloyd, C.L. Galle and S.R. Keith)

*Excerpted from HortScience 41(3):707-710.
June 2006.*

Disease Control:

Bacterial leaf blight control on *Cornus mas*.

The two most effective chemicals for controlling bacterial leaf blight on *Cornus mas* were Phyton 27 and Agri-Mycin. The fungicides Camelot and Bordeaux Mixture were effective when disease severity was moderate, but were not effective when disease severity was high. Pesticide applications should be initiated soon after budbreak when the first symptoms appear. (M.T. Mmbaga and E.C. Nnodu)

*Excerpted from HortScience 41(3):725-728.
June 2006.*

Black cohosh prone to disease in heavy soil.

Black cohosh (*Actaea racemosa* or commonly, *Cimicifuga racemosa*) is becoming a popular treatment for menopausal symptoms. Current demand has resulted in wild-collection, which will not be sustainable. There is a need to develop commercial production strategies for black cohosh. Earlier cultivation experiments resulted in crop failure due to root rot. This experiment determined that single fungicide applications, fall vs. spring planting and shallow vs. deep planting were not able to compensate for a poorly-drained soil. Black cohosh produces a large rhizome (the principal medicinal organ), which is sensitive to heavy soil and prone to fungal attack if soil water drainage is not adequate. At this point, proper site selection is the only reliable recommendation for efficient black cohosh cultivation. (A.L. Thomas, R.J. Crawford, Jr., L.J. Haverman, W.L. Applequist, B.E. Schweitzer, S.F. Woodbury and J.S. Miller)

*Excerpted from HortScience 41(2):374-376.
April 2006.*

Reducing anthracnose symptoms on wintercreeper. Chlorothalonil, mancozeb and trifloxystrobin were applied alone or in rotations to control anthracnose in field and container production of wintercreeper euonymus. Results indicate that fungicide rotations, particularly those containing mancozeb, were more effective at reducing anthracnose symptoms than each fungicide alone. Resistant cultivars are also recommended since fungicides (even in rotation) did not eliminate disease symptoms. Cultural practices, such as growing under shade with afternoon irrigation can also reduce disease incidence. (S.L. Schupback-Ningen, J.C. Cole, J.T. Cole and K. E. Conway)

*Excerpted from HortTechnology, April-June
2006, 16(2):211-215.*

New Cultivars:

‘Garden White’ – A large white fancy-leaved caladium. ‘Garden White’ is an extremely vigorous, large leaved, tall white fancy-leaved cultivar that is ideal for sunny landscapes (in the south) and large containers. It also has improved tuber production over the commonly grown white cultivars Aaron, Candidum, Candidum Junior and White Christmas. Information on tuber availability and propagation agreements can be obtained from the Florida Foundation Seed Producers, Inc., P.O. Box 309, Greenwood, FL 32443. (Z. Deng and B.K. Harbaugh)

*Excerpted from HortScience 41(3):840-842.
June 2006.*

‘Summer Rose’ – A fancy-leaved caladium for containers and landscapes. ‘Summer Rose’ is a good replacement for ‘Rosebud.’ Tuber production and field performance of ‘Summer Rose’ were better than ‘Rosebud.’ Information on tuber availability and propagation agreements can be obtained from

the Florida Foundation Seed Producers, Inc.,
P.O. Box 309, Greenwood, FL 32443. (Z. Deng
and B.K. Harbaugh)

*Excerpted from HortScience 41(2):468-470.
April 2006.*

‘Dynamite Red’ – A red fancy-leaved caladium for sunny landscapes and containers. ‘Dynamite Red’ was bred primarily for use in containers because it produces many leaves without the need to de-eye tubers. ‘Dynamite Red’ produces large leaves with intense red color and performs well in sunny landscapes and large containers. It has improved tuber production over ‘Frieda Hemple’ and ‘Postman Joyner.’ Information on tuber availability and propagation agreements can be obtained from the Florida Foundation Seed Producers, Inc., P.O. Box 309, Greenwood, FL 32443. (Z. Deng and B.K. Harbaugh)

*Excerpted from HortScience 41(2):471-473.
April 2006.*

Multi-flora gerbera cultivars for landscapes and large pots. ‘UF Multi-flora Peach’ and ‘UF Multi-flora Pink Frost’ are vigorous cultivars and produce large plants with a continuous supply of flowers in the garden. Although their flowers are not large, their plants display multiple flowers and buds resulting in plants with as much color as plants with larger, but fewer flowers. In addition, ‘UF Multi-flora Peach’ has shown intermediate powdery mildew resistance. Information on availability and propagation agreements can be obtained from the Florida Foundation Seed Producers, Inc., P.O. Box 309, Greenwood, FL 32443. (Z. Deng and B.K. Harbaugh)

*Excerpted from HortScience 41(3):843-845.
June 2006.*

Heat-tolerant lisianthus for potted plants.

The most important and distinguishing attribute of all the Double Joy cultivar-group cultivars compared with other commercial lines was their heat tolerance. UF Double Joy cultivars are intended to be used as flowering potted plants in containers $>$ or $=$ 15 cm pots. Treatment with growth regulators is necessary for production in smaller pots. Three to four plugs per $>$ or $=$ 15 cm pot are recommended for optimal marketing display. Distribution of seed is through the Florida Foundation Seed Producers, Inc., P.O. Box 309, Greenwood, FL 32443. (B.K. Harbaugh and Z. Deng)

*Excerpted from HortScience 41(3):846-849.
June 2006.*

More heat-tolerant lisianthus for potted plants.

The UF Savanna cultivar group is heat tolerant and intermediate in height between the Florida cultivar group and the Maurine cultivar groups. The UF Savanna cultivar group is represented with eight colors including blue, pink, white, silver, blue rim, pink rim, blue frost and pink frost. The UF Savanna cultivars are intended to be used as flowering potted plants in containers $>$ or $=$ 15 cm pots. They have a spray-type flower display that is desirable if lisianthus are to be used as a pot plant making height control easier. Treatment with growth regulators is necessary for production in smaller pots. Three to four plugs per $>$ or $=$ 15 cm pot are recommended for optimal marketing display. Distribution of seed is through the Florida Foundation Seed Producers, Inc., P.O. Box 309, Greenwood, FL 32443. (B.K. Harbaugh and Z. Deng)

*Excerpted from HortScience 41(3):850-854.
June 2006.*

‘Arapaho’ and ‘Cheyenne’ Lagerstroemia.

Two new Lagerstroemia cultivars, released from the National Arboretum in 2003, are

characterized by bright red flowers and powdery mildew resistant foliage. ‘Arapaho’ and ‘Cheyenne’ grow and flower best in full sun with a heavy loam to clay soil (pH 5.5-6.5). Both are reliably top hardy to USDA Hardiness Zone 7b and root hardy to Zone 6. Because crape myrtles flower on current season’s growth, they can be treated as perennials in colder climates. For propagation use softwood cuttings from vigorously growing shoots rooted under intermittent mist. Plants are suitable for either field or container production, and will usually produce flowers the first summer after propagation, but do not usually bloom profusely until after 2 to 3 years of growth. Bark begins to exfoliate after 3 to 5 years of growth. The upright, tree-type habit of ‘Arapaho’ makes it well suited for use as a specimen plant, as a street tree, or in mass plantings in public parks. The rounded, compact, multi-stemmed habit of ‘Cheyenne’ makes it suitable for use as a specimen plant or in mass plantings, a shrub border or informal hedge. Like all other crape myrtles released from the National Arboretum, ‘Arapaho’ and ‘Cheyenne’ are not patented, so may be propagated and sold freely. Plants should be available from a limited number of nurseries by Spring 2006. (M.R. Pooler)

Excerpted from HortScience 41(3):855-856. June 2006.

Marketing:

Invasive plant species survey results from Philadelphia Flower Show. A consumer survey conducted at the 2004 Philadelphia Flower Show indicated that a majority of participants (81.5%) were aware that non-native plants were used in the landscape and that these plants may be invasive in natural areas. Knowing that a plant is potentially invasive would prevent most (approx. 90%) respondents from purchasing it and using it in their landscape. Less than half (41.3%) believed that

laws should be passed to prevent the sale of non-native plants while 27.8% believed that laws should be passed to allow sale of only native plants in their area. (K.K. Kelley, J.R. Conklin, J.C. Selmer and R.M. Bates)

Editor’s note: This survey included confusing language that is problematic for the nursery industry when dealing with the invasive plant issue. Questions about regulation referred to non-native vs. native plants rather than invasive vs. non-invasive plants. The nursery and landscape industry, researchers and extension professionals must be clear about differentiating invasiveness and nativity. There are many plants that are non-native and also non-invasive.

Excerpted from J. of Environ. Hort. 24(1):53-58. March 2006.

The Economic Impact of the Green Industry in the United States. Economic impacts for the U.S. Green Industry in 2002 were estimated at \$147.8 billion in output, 1,964,339 jobs, \$95.1 billion in value added, \$64.3 billion in labor income, and \$6.9 billion in indirect business taxes, with these values expressed in 2004 dollars. In addition, this study evaluated the value and role of urban forest trees (woody ornamental trees); the total output of tree production and care services was valued at \$145.55 billion, which translated into \$21.02 billion in total output impacts, 259,224 jobs, and \$14.12 billion in added value. Delaware’s impacts were estimated at \$448 million in output, 6,359 jobs, \$297 million in value added, with these values expressed in 2004 dollars. For urban forest trees (woody ornamental trees); the total output of tree production and care services was valued at \$55 million, which translated into \$90 million in total output impacts, 1,045 jobs, and \$65 million in added value. (CR. Hall, A.W. Hodges, J.J. Haydu)

Excerpted from HortTechnology, April-June 2006 16(2): 345-353.

Publications

Ornamental Pesticide Guide From Ohio State

Jane C. Martin, Extension Educator,
Horticulture at Ohio State:

‘General Use Pesticide Guide for Ornamentals,’ is for use by Extension educators, Master Gardener Coordinators, and MGs who work with the general public on office hotlines or at public events. This guide provides the recommended insecticide active ingredient(s) for the most common insects and mites AND some brand name products that contain them. There are four sections in this guide; general landscape pests, specific pests of trees and shrubs, annuals and perennials, and insecticide tables that list active ingredients and brand name products. You can download this guide from the Franklin County website at: <http://franklin.osu.edu/hort/hort.htm> . Click on the last box under "Site Index," labeled ‘2006 General Use Pesticides for Woody Plants, Annuals and Perennials.’ This is a PDF file and is about 15 pages in length.

Peterson Field Guide to Ferns of Northeastern and Central North America,

Second Edition. Up-to-date, easy-to-use, field reference on the native ferns. Plus, the size and weight of this book make it “carry-able” on woodland hikes. Keys are well organized and logical to the casual user as well as the professional taxonomist. Line drawings with arrows pointing to the key characteristics are excellent. The glossary is easy to use with the technical terms bolded and easy to locate. The bibliography is extensive and includes related Web sites. Boughton Cobb, Elizabeth Farmsworth, and Cheryl Lowe. 2005. Houghton Mifflin Company. Boston. 417 pages, paperback. ISBN 0-618-39406-0.

Profitable Perennials. Detailed production information for 30 of the most popular crops helps growers to plan and get the most from

their perennial programs. Features include: detailed tables outlining various phases of perennial production, extensive crop-by-crop talbe for using plant growth regulators, tips on forcing perennials to bloom out of season to increase sales. www.ballbookshelf.com for fastest service. Ball Bookshelf, P.O. Box 9, Batavia, IL 60510. Tel: 1-888-888-0013, fax: 1-888-888-0014.

List of Names of Woody Plants/list of Names of Perennials. Updated versions containing 17,000 new listings of plant nomenclature reference guides now available. With the addition of the new listings, these reference guides go even further in achieving worldwide uniformity in the nomenclature of plants important in simplifying communication between all partners in the production and marketing chain. In addition to the expansion of these nomenclature guides, there is now also improved on-line access. For purchase information, or to review on-line search options, visit: www.internationalplantnames.com

Best Management Practices for Greenhouse and Container Operations just released by the Delaware Nutrient Management Commission. The recommendations include practices including runoff management, collective basins, nutrient management, irrigation management and pesticide management. Anyone who would like to receive a copy may contact the Delaware Nutrient Management Commission at (800)282-8685 (from Delaware only) or (302)698-4500; fax, (302)697-6287 or e-mail: nutrient.management@state.de.us



Calendar

July 17-22 – APLD Conference titled ‘Design Inspiration from The Birthplace of America’s Gardens’. Hyatt Regency Penn’s Landing, Philadelphia, PA. Registration deadline June 30. For more info: APLD.org or (717)238-9985.

July 25-27 – Penn Allied Nursery Trade Show (PANTS), Atlantic City, NJ. E-mail www.pantshow.com

July 28 – 10th Annual Woody Plant Conference, Chanticleer, Longwood Gardens, The Morris Arboretum of the University of Pennsylvania, The Pennsylvania Horticultural Society, The Scott Arboretum of Swarthmore College, Tyler Arboretum. The Scott Arboretum of Swarthmore College, Swarthmore, PA. This year’s topics will range from conifers to tree disease management. Call (610)388-1000, ext. 507; www.longwoodgardens.org.

August 2 – Saving Energy in Your Greenhouse/Nursery Operations, Davidsonville Ruritan Bldg., Davidsonville, MD. Suzanne Klick, (301)596-9413.

August 5 – Butterflies in your Garden, Continuing Education at Mt. Cuba Center. 10am – 4pm, Cost is \$50 includes lunch. Phone:(302)-489-0237 or visit www.mtcubacenter.org

August 10 – Water Runoff Solutions, “Rain” Gardens, & Wet Meadows, Longwood Gardens Short Courses, Workshops, and Garden Walks. – 8:30pm (062PSH2E). Fee: \$59 (transportation to Flint Woods included). Phone: (302)-489-0237 or visit www.mtcubacenter.org

August 10-12- SNA 2006 The World’s Showcase of Horticulture, Atlanta, GA. Call 1-770-953-3311, www.sna.org for more information.

August 16-20 – ANLA Landscape Operations Tour, Louisville and Lexington, KY, www.anla.org

August 17 – Virginia Nursery and Landscape Association annual field day, Bennetts Creek Nursery, Isle of Wight, VA (800)476-0055, info@vnla.org.

August 19 – Ferns, Continuing Education at Mt. Cuba Center. 10am – 1pm, Cost is \$25 (refreshments included). Phone: (302)-489-0237 or visit www.mtcubacenter.org

August 23 – Evening Cut Flower Grower Session, Central Maryland Research and Education Center, Ellicott City,

MD., Suzanne Klick (301)596-9413.

August 23-27 - American Nursery and Landscape Association Landscape Operations Tour, Louisville and Lexington, KY., Tele: (202)789-2900, www.anla.org.

September 5-8 – Sixth Annual Fall Event, The Garden Center Group, Marriott Hartford Downtown, Hartford, CT. Call (410)313-8067; e-mail wendy@thegardencentergroup.com; www.thegardencentergroup.com/events.htm.

September 6 - *Asters: Autumn Stars and Their Companions* Lecture by Jeanne Frett, Research Horticulturist, Mt. Cuba, 7:00 – 8:00 p.m., Free to UDBG Friends' Members; \$5 Nonmembers
Location: Room 132 Townsend Hall, University of Delaware, 531 South College Avenue, Newark DE
For registration information, please call (302) 831-2517.

Plants will be available for sale at the UDBG Friends Florabundance Plant Sale, Saturday, September 9, 9:00 a.m. – 3:00 p.m.

September 8 – Pest ID Walk, Longwood Gardens Professional Courses. 9am – 12 noon (062PSPIM0) / OR September 22, 9am – 12noon (062PSPPM0. Fee: \$79 (dress for the outdoors). Phone: (610)388-1000, ext. 559. www.longwoodlearning.org

September 11 – Turf for the Professional, Longwood Gardens Professional Courses. 1pm – 4pm (062PSTPA) OR September 29, 1pm – 4pm (062PSTTA). Fee: \$79 (dress for the outdoors). Phone: (610)388-1000, ext. 559. www.longwoodlearning.org

September 11 – Weed ID Walk, Longwood Gardens Professional Courses. 9am – 12noon (062PSWIM) OR September 29, 9am – 12noon (062PSWWM). Fee \$79 (dress for the outdoors). Phone: (610)388-1000, ext. 559. www.longwoodlearning.org

September 11 - Composting Yard Waste: An Alternative To Landfills, Instructor: Dot Abbott, 6- 8 PM, Kent County Cooperative Extension office, Dover Conference rooms #109 & #110. Contact Dot Milsom (302-831-2531).

September 13 – Greenhouse & Interiorscape Pests, Longwood Gardens Professional Courses. 4pm – 8pm (062PSGIE). Fee: \$99 (light dinner included) Phone: (610)388-1000, ext. 559. www.longwoodlearning.org

September 14 – Grow Wildflowers in Containers, Continuing Education at Mt. Cuba Center. 1:30pm –

3:30pm, Cost is \$25. Phone: (302)489-0237 or visit www.mtcubacenter.org

September 14 – Ornamentals Research Expo, UDBG, Newark, DE, 4- 7:30 PM, \$10, Contact Dot Milsom, 302-831-1375.

September 14 – Chester County Landscape Update, 1pm – 4:30pm. Chester County Government Services Center, West Chester, PA. Contact Cheryl Bjornson (610)696-3500

September 15 – Rain Garden Seminar for Landscape Professionals, Northern VA Regional Commission and Community Appearance Alliance; Meadowlark Gardens Regional Park, Vienna, VA, kmull@novaregion.org, (703)642-4625.

September 15 – Applying Cultural Diversity I Horticulture Programs. Offered by the Glass Garden at Rusk Institute, NYU Medical Center, New York, N.Y. A symposium that examines where human culture and horticulture intersect. Professionals will share their expertise, offer practical examples, and highlight benefits of using horticulture activities to bridge cultural differences and enrich programs for all people. (glassgardenrusk@nyumc.org or call Nancy Chambers, 212-263-6058).

September 18 and 20 – Ornamentals Diseases and Their Control, Instructor: Bob Mulrooney, 3:30 - 6 PM, Fischer Greenhouse, Newark, DE (\$10), Contact Dot Milsom (302-831-2531).

September 18 - Composting Yard Waste: An Alternative To Landfills, Instructor: Dot Abbott, 6-8 PM Carvel Research & Education Center, Georgetown, Carvel Conference Room #3. Contact Dot Milsom (302-831-2531).

September 19 – Montgomery County Landscape Update, 1pm – 4:00pm Montgomery County 4-H Center, Creamery, PA. Contact: Mary Concklin (610)489-4315.
September 20 – 21 – GCA's Fashion in Bloom, Garden Center of America (GCA), *Today's Garden Center*, Green Industry Yellow Pages Inc., New Growth Marketing, Clear Window MultiMedia. The Conard-Pyle Co., Jennersville, PA Call (440) 602-9115; e-mail kim@clearwindow.net; www.fashioninbloom.com

September 20 – Berks County Landscape Update, 9am to 12:00 noon. Berks County Agricultural Center, Leesport, PA. Contact: Nancy Bosold (610-378-1327).

September 22 – Plant Disease ID Walk, Longwood

Gardens Professional Courses. 1pm – 4pm (062PSPDA)
OR September 22, 1pm – 4pm (062PSPPA). Fee: \$79
(dress for the outdoors). Phone: (610)388-1000, ext. 559.
www.longwoodlearning.org

September 22-24 – JC Raulston Arboretum 30th
Anniversary Symposium, Plan – and Plant for a Better
World, Raleigh, North Carolina. The JC Raulston
Arboretum 30th Anniversary Symposium will celebrate the
founding of the JC Raulston Arboretum at NC State
University and J.C. Raulston's life through speakers
drawn from colleagues, students, plant professionals, and
the nursery industry, all of whom are richer for his legacy.
For more information, please visit
www.ncsu.edu/jcraulstonarboretum.org.

September 24-27 – 2006 Perennial Production
Conference. Marriott East, Indianapolis, Ind. Sponsored
by *GrowerTalks* magazine, in cooperation with OFA, an
Association of Floriculture Professionals
(www.ballpublishing.com/conferences/perennial).

September 25 - Composting Yard Waste: An Alternative
To Landfills, Instructor: Dot Abbott, 6-8 PM
New Castle Cooperative Extension office, Newark (their
new location) Contact Dot Milsom, 302-831-1375.

September 25 – Tropical Plants in Temperate Gardens
with Barry Yinger. Longwood Gardens Continuing
Education Series. 7pm (062SLTTE). Fee: \$29 (includes
dessert reception). Phone: (610)388-1000, ext. 559.
www.longwoodlearning.org.

September 26 – Bucks County Landscape Update.
1:00pm – 4:00 pm. Neshaminy Manor Center,
Doylestown PA. Contact: Scott Guiser (215)345-2183.

September 26 – Lehigh County Landscape Update,
4:00pm – 9:00pm, Schnecksville Fire Company Pavilion,
Schnecksville, PA. Contact: Emelie Swackhamer
(610)391-9840

September 30 – Asters for the Mid-Atlantic Region,
Continuing Education at Mt. Cuba Center. 10am – 1pm.
Cost \$25 (refreshments included). Phone: (302)-489-0237
or visit www.mtcubacenter.org

October 2-6 – Tree Climbing School. Morris Arboretum,
Philadelphia, PA. Contact: Cheryl Bjornson (610)696-
3500. Are you thinking about becoming an arborist? This
five-day class is designed to teach the fundamentals of
tree maintenance. Major emphasis will be placed on
learning the skills required to climb and prune trees. This
event is co-sponsored by the Penn-Del chapter of ISA.
Course fee is \$400.

October 3 and 5 - Landscape and Turf Weeds and Their
Control, Instructors: Steve Hart and Gordon Johnson – On
October 3 – 3:30 – 6 PM, Kent County Extension Office,
Dover, DE, and October 5 - 3:30 – 6 PM, Fischer
Greenhouse, Newark, DE, \$10 (or \$5 for one session
only) Contact Dot Milsom (302-831-2531).

October 7 – Meadow Delights, Continuing Education at
Mt. Cuba Center. 10am – 3pm. Cost \$50 (lunch included).
Phone: (302)-489-0237 or visit www.mtcubacenter.org

October 10 and 12 - Ornamentals Insects and Their
Control, Instructors: Dewey Caron and Brian Kunkel,
3:30 – 6 PM Research and Education Center,
Georgetown, DE, (\$10) Contact Dot Milsom (302-831-
2531).

October 10 – November 7, 14, 21 - Basic Grounds
Management School, Neshaminy Manor Center,
Doylestown, PA. Contact: Scott Guiser (215)345-3283.
This seven-week course of instruction is designed to
provide basic horticultural knowledge to entry-level
grounds managers. Subjects include soils and fertilizers,
turfgrass maintenance pest identification and management,
proper planting and mulching techniques, snow and ice
management, and landscape plant identification. The
course is co-sponsored by the Philadelphia Branch of the
PGMS and Penn State.

October 11 & 14 (two sessions) – Native Plants for
Autumn Interest. Times: Oct. 11th-1:30pm – 3:30pm, Oct.
14th-10am – 12 noon. Cost \$50. Phone: (302)-489-0237 or
visit www.mtcubacenter.org

October 17 – Attracting Wildlife to your Garden,
Longwood Gardens Short Courses, Workshops, and
Garden Walks. –7pm – 9pm (062PSAWE). Fee: \$39.
Phone: (610)388-1000, ext. 559.
www.longwoodlearning.org

October 18 – Snow and Ice Management Seminar,
Villanova University, Villanova, PA. Contact: Kevin
O'Donnell (610)519-4426. Join industry experts and
follow grounds managers at this special event focused on
snow and ice management. Sponsored by the Philadelphia
Branch of PGMS.

October 19 & 20 – Urban Forestry Conference Toftrees
Resort, State College, PA. Contact: Dr. Bill Elmendorf at
(814)863-7941 or wfel@psu.edu

October 20 – the Annual Perennial Plant Conference will
be held at the Scott Arboretum of Swarthmore College.

Co-sponsored by Chanticleer, Longwood Gardens, The Hardy Plant Society/Mid-Atlantic Group, the Pennsylvania Horticultural Society and the Scott Arboretum, the Conference covers topics of interest to horticulturalists and gardeners. For information call (610)388-1000 x 507.

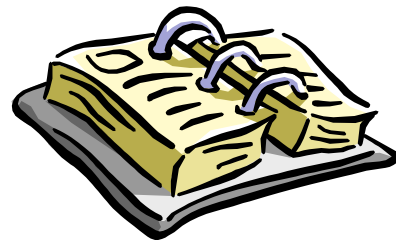
October 20 – 21- The APGA Mid-Atlantic Regional Meeting hosted by Norfolk Botanic Garden. Information about the meeting will be available soon.
October 24 – Designing Peirce’s Woods with Gary Smith. Longwood Gardens Continuing Education Series. 7pm (062SLPWE). Fee: \$29 (includes dessert reception). Phone: (302)-489-0237 or visit www.mtcubacenter.org

November 1 – Reflections of a Plant Explorer, Continuing Education at Mt. Cuba Center. 5:30pm – 7:30pm. Cost \$35 (refreshments included). Phone: (302)-489-0237 or visit www.mtcubacenter.org

November 8 – Wildflower Seed Collecting, Continuing Education at Mt. Cuba Center. 5:30pm – 7:30 pm. Cost \$25 (refreshments included). Phone: (302)-489-0237 or visit www.mtcubacenter.org

November 12 – Discover Delaware Woodlands, Continuing Education at Mt. Cuba Center. 10am – 2pm. Cost \$50 (lunch included). Phone: (302)-489-0237 or visit www.mtcubacenter.org

December 2 – Creating Outdoor Holiday Light Displays, Gardens Short Courses, Workshops, and Garden Walks. 6:30pm – 9:30pm (062PSOBE). Fee: \$69 (includes a near to blooming size orchid to take home). Phone: (610)388-1000, ext. 559. www.longwoodlearning.org



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PLASTICS RECYCLING PROGRAM

Who can participate?

The program is open to all commercial nurseries and growers in Maryland, Virginia, North Carolina, Delaware, Pennsylvania, New Jersey, West Virginia and Ohio.

What types of plastics are accepted?

Pots, plug trays, flats and greenhouse film are recyclable. The pots and trays will be stamped with a recycling code—generally “2” for pots and “6” for trays.

How should the plastic be prepared?

Each type of plastic must be separated on its own pallet. As long as the recycling code is the same, different colors and sizes can be mixed on a pallet. Mixed pallets can be put on the truck, as long as each pallet only contains one type of plastic. If you are unsure of the plastic, please call and we will try to help figure it out. If you have only a little plastic, that you can not determine the type, you can put it on one pallet and mark it “miscellaneous”.

Try to knock the majority of the dirt out of the pots and trays. Usually, tapping the back of the piece will accomplish this. A thin layer of dirt is permissible but excessive dirt could result in rejection of the load. Trays and pots should be nested tightly and stacked on the pallet. Generally, it is best to create 4-foot stacks and then lay each stack, on its side, on the pallet. The pallet should be stacked 7-8 feet high and then banded or stretch-wrapped to avoid movement during transport. The key is to place as much as possible on each pallet.

The greenhouse film should be folded or rolled and placed on a pallet and, then, secured, with film or banding. Greenhouse film will also be accepted in bales or stuffed in cartons. In no case, can the film be stuffed into the truck. All plastic must be easy to load and unload.

What is the plastic worth?

The value of the plastic depends on the type of plastic, the total weight and your location.

We pay the freight, in all cases, so it is critical to load the truck as heavy as possible. Locations close to our hubs in Delaware and Ohio can earn a bit more than further distant places.

On loads under 20,000 lbs, most plastics are worth about \$.02 per pound. Loads over 20,000 can earn an additional \$.02 per pound. Locations near to our hub can earn another \$.01-\$.02 per pound. The weight is determined after grinding. We will ballpark the value, for you, prior to pickup. Checks are sent within 30 days of the pickup. Besides earning money for the plastic, you also save the hauling and dumping charges that run into the hundreds of dollars. And you are helping the environment.

How do I arrange a pickup?

Call Steve Wasserman at 410-374-2196 or email swasserman9@yahoo.com. If you have a full load, we can make a pickup within a few days. If you have a partial load, we will need to match you with another nursery in your area. This may require a few extra days to arrange the pickup.

Please direct all questions to: Steve Wasserman

Cindarn Recycling
16154 Trenton Road
Upperco, Md. 21155
410-374-2196

Note: Usual disclaimer applies. Cindarn Recycling may not be responsible for any errors, omissions, and/or inconsistencies stated here. Our offer prices may change depending on the market conditions. We reserve the option of rejecting materials which may be contaminated, not properly sorted or not packaged according to our instructions.

