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

Happy Holidays! It's that time of year that can best be described as a total "blurr". Last minute installations, final mow cycles, the Christmas push at the garden centers, preparations for snow removal, as well as our many personal commitments and general hustling and bustling. The DNLA is no different. We recently hosted another successful Ornamental & Turf Workshop, and are making final arrangements for the Delaware Horticulture Industry Expo and our 2001 Membership Directory.

The Ornamental & Turf Workshop was held on November 9th at the Hockessin Memorial Hall. More than 100 people participated in this interesting and informative event. We welcome any feedback you may have. Please take a moment and complete the questionnaire was distributed to those of you who attended. This helps us to continuously meet the educational needs of our members.

The Delaware Horticulture Industry Expo is fast approaching. It will be held on January 17th and 18th at the Modern Maturity Center in Dover. Featured topics include "Landscape Bidding and Estimating" by Jerry Gaeta of Vander Kooi & Associates; "Landscaping That Works – The Keys to Success"; "Perennials for Specific Situations"; "The Latest Greatest & Most Unusual Shrubs"; "Hot New Annuals"; Nutrient Management and Invasive Plant updates; and the increasingly popular CNP Prep Session. Please try to join us for the fun!

Last but far from least, the holidays are a time of giving. However, many of our members and board members give of their time, talents and financial support all year round. Thanks to each and every one of you! I'd like to offer a special thanks to The Sterling Nursery for their very

generous gift to the Research & Education fund, as well as the many other organizations that consistently support this worthwhile fund. This fund subsidizes research and educational projects that are of interest and benefit to the horticulture industry in the state of Delaware.

The Delaware Invasive Species Council and the DNLA are sponsoring a seminar on February 22nd entitled, "Using Natives in the Landscape." The event will be held at the Department of Agriculture and will feature presentations from industry professionals and hands-on training. More details will follow.

On October 24th, 15 people took the Certified Nursery Professional Exams. Congratulations to the following individuals:

NEW CNP's:

Daniel Fox
State of Delaware – Division of Facilities Management
Landscape Specialist

John Dorman
Dorman's Lawncare, Inc.
Landscape Specialist
Turfgrass Management Specialist

Mark Hoffman
Countryside Lawn & Landscape, Inc.
Landscape Specialist
Garden Center Specialist

Helen Waite
Waite Garden Design
Landscape Design Specialist

New Specialty Added:

Pat Hogan
Delaware River and Bay Authority
Greenhouse Production Specialist

Welcome to our new members:

Integrated Turf Management Systems, Inc.
200 Ruthar Drive, Unit 7
Newark, DE 19713
302/ 266-8000

Sunset Vista Designs
P.O. Box 5535
Wilmington, DE 19808
302/ 455-9961

Garden Concepts
1531 Savannah Road
Lewes, DE 19958
302/ 644-3341

Waite Garden Design
P.O. Box 532
Nassau, DE 19969-0532
302/ 645-2156

Country Folks Grower/ Lee Publications
P.O. Box 70
Rehoboth Beach, DE 19971
302/ 226-2339

Ashland Property Management & Landscaping Co.
P.O. Box 3568
Wilmington, DE 19807
302/ 239-5324

Tuel & Tingle Nursery
P.O. Box 188, 1066 Wawaset Road
Unionville, PA 19375
610/ 347-2234

Rodney Robinson Landscape Architects
707 Philadelphia Pike
Wilmington, DE 19809
302/ 764-9554

Wilmington Country Club
4825 Kennett Pike
Wilmington, DE 19807
302/ 655-2905

Delaware State Parks
1021 West 18th Street
Wilmington, DE 19802
302/ 577-7020

FROM THE PRESIDENT
Steve Sterling
Delaware Nursery and Landscape
Association

With the holidays upon us, I am sure all of you with garden centers are bustling with activity. I very much admire your hard work and dedication.

Thank you to all who attended our recent Turf Workshop. This workshop continues to be an education-filled seminar and always very well attended. I hope everyone enjoyed it.

On behalf of the board, I would like to thank John Ellingsworth for his numerous years of service representing DNLA on the Delaware Council of Farm Organizations. This organization is comprised of many agricultural associations. The organization meets once a month and offers a direct pipeline to the Secretary of Agriculture. This connection has been extremely useful when certain problems arise. John will be stepping down from this position next year and I will be taking his place. Thanks again John.

In January we will be having our annual membership meeting. There are several board positions available. If anyone is interested, please be sure to contact Valann Budischak for more information.

Have a safe and happy holiday season.

Steve Sterling
President

Vincent Russo
9 Leafy Lane
Newark, DE 19702

U of D NEWS

Susan Barton
Extension Specialist

In the last issue, I told you that the Urban Nutrient Report was completed and outlined some results. If you would like to receive a copy of the summary report, please call (831-1375) me or email (sbarton@udel.edu) me and I will send it to you. I presented some information from the report at the Ornamentals and Turf Workshop in November and I'll be highlighting the results again at the Hort Industry Expo in January. The Nutrient Management Commission has started to look at our industry. The first group to be addressed is the golf courses. A group of interested superintendents have volunteered to put together the proposed guidelines for nutrient management planning. They will bring those guidelines back to the Commission in February.

While our report shows that the impact of landscape fertilization in total is minor, there is a potential for specific site impacts and the law states that our industries must complete nutrient management plans. So, we will have to come up with a system for doing so. Tom Sims has just received a grant to study the economic impact of nutrient management planning. I plan to work with him to model nutrient management planning in a golf course and for a landscape maintenance business. If you have a landscape maintenance business that includes both commercial and residential accounts and are willing to work with us, let me know!

Some of you who drive around on I95 North of Wilmington may have noticed first multi-colored flags and then new plantings on berms in the highway median. This is part of the I95 renovation project. The landscaping will be installed in several phases. Woody plants were installed this fall. We used tough, native species. A number of people have noticed them already and we hope to make a positive impact

on the beauty of the highway. The berms are certainly less than ideal for planting, so we hope the species we've chosen will survive. These plantings might promote the use of native plants in general. Consumers often ask for plants that they see in public plantings. We will be working on weed control this spring and plan to plant perennials in the fall. If you'd like a list of the species we've used on this project, let me know.

Invasive plants are becoming a hot issue in the nursery and landscape industry. I have included several articles in the DNLA News on this subject recently. This issue includes an article by Steve Castorani (Gateway Garden Center and North Creek Nurseries). We have included a list of additional articles that you can read to get updated on the subject. We will also be covering this topic at the Delaware Horticulture Industry Expo in January. Rob Line (Dept. of Parks and Recreation) will talk about the dangers that invasives impose when they invade natural areas and will also present some opportunities for the industry. Rick Lewandowski (Mt. Cuba Center) will speak about the issue from the industry perspective and address concerns about plants that might be removed from commerce. We hope we can stimulate a lively debate about this very important topic in Delaware!

Wishing you all a very good holiday season and hope to see you at the Expo in January.

**VIABLE-SEED PRODUCTION FROM
MISCANTHUS MAY INDICATE
POTENTIAL INVASIVENESS**

**Dr. Mary Hockenberry Meyer
and Courtney L. Tchida
University of Minnesota**

A beautiful, popular grass, *Miscanthus* can be self-seeding and potentially invasive. Large stands of self-seeded, naturalized *Miscanthus* have established themselves along disturbed roadsides in three counties of western North Carolina (Zone 6). In 1996 and 1997, we evaluated the seed viability of 41 *Miscanthus* taxa to assess whether seed viability was taxon- and/or zone-specific.

Inflorescences from field-grown, mature plants in zones 4, 5, 6 and 7 were sent to the Minnesota Landscape Arboretum, Chanhassen. Inflorescences were stored at 41° and cleaned throughout winter. Seed was separated from hulls and shaff. For each inflorescence, 25 seeds were rolled into a paper towel moistened with distilled water and placed in a plastic bag at room temperature with exposure to minimal light. We evaluated germination one month later.

Results:

While germination percentages varied widely among taxa and hardiness zones, seed viability was generally greatest from plants grown in zones 5 and 6 (see table). Although germination percentages tended to be lower in Zone 4, the shorter growing season did not eliminate viable seed and the potential for invasiveness. Most taxa had low germination percentages in Zone 7, with the exception of four *M. sinensis* cultivars: ‘Puektchen’, ‘Gracillimus’, ‘Malepartus’ and ‘Silberfeder’.

Eleven taxa had 18 percent or less seed viability

in three or more of the zones (see table). These probably have the least risk of self-seeding and becoming invasive. Yet, seed viability depends on a variety of factors, such as hardiness zone, cultural and management practices, and the taxon. Further research is needed to more fully assess seed-germination potential and competitiveness of *Miscanthus*.

Table with germination percentages is printed on the next page.

***Miscanthus* Taxa w/ seed viability up to 18 %**

Taxon	Germination
<i>Miscanthus</i> x giganteus	0%
<i>M. sinensis</i> ‘Autumn Light’	NA in Zone 7; 0%
<i>M. sinensis</i> ‘Dixieland’	0%
<i>M. sinensis</i> ‘Kirk Alexander’	0%
<i>M. sinensis</i> ‘Little Kitten’	NA in Zone 5; 0- 8%
<i>M. sinensis</i> ‘Morning Light’	0% to 18%
<i>M. sinensis</i> ‘Rigoletto’	NA in Zone 5; 0-4%
<i>M. sinensis</i> ‘Silberpfeil’	NA in Zone 5; 0%
<i>M. sinensis</i> ‘Strictus’	0% to 16%
<i>M. sinensis</i> ‘Variegatus’	0% to 16%
<i>M. sinensis</i> ‘Yaku Jima’	NA in Zone 4; 0- 4%

Germination Percentages of *Miscanthus Taxa*¹

Taxon	Germination							
	Zone 4		Zone 5		Zone 6		Zone 7	
	1996	1997	1996	1997	1996	1997	1996	1997
<i>Miscanthus oligostachyus</i>	0%	-	-	-	40%	-	0%	-
<i>M. sacchariflorus</i>	-	17%	64%	48%	75%	96%	-	-
<i>M. sinensis</i> 'Adagio'	10%	40%	0%	-	54%	12%	0%	-
<i>M. sinensis</i> 'Bitsy Ben'	32%	-	24%	-	-	-	-	-
<i>M. sinensis</i> 'Bluetenwunder'	18%	16%	17%	72%	48%	84%	-	-
<i>M. sinensis</i> 'Ferner Osten'	-	32%	-	52%	-	76%	-	-
<i>M. sinensis</i> 'Flamingo'	17%	-	-	-	57%	-	-	-
<i>M. sinensis</i> 'Goliath'	48%	-	-	-	34%	-	0%	-
<i>M. sinensis</i> 'Gracillimus'	-	0%	-	0%	-	0%	-	36%
<i>M. sinensis</i> 'Graziella'	0%	40%	28%	72%	44%	88%	0%	0%
<i>M. sinensis</i> 'Grosse Fontane'	0%	0%	0%	32%	58%	56%	0%	0%
<i>M. sinensis</i> 'Herkules'	20%	-	-	-	29%	-	-	-
<i>M. sinensis</i> 'Juli'	35%	24%	-	-	61%	64%	-	-
<i>M. sinensis</i> 'Kaskade'	-	0%	-	60%	-	72%	-	-
<i>M. sinensis</i> 'Kliein Fontane'	64%	-	-	-	33%	-	-	-
<i>M. sinensis</i> 'Malepartus'	47%	24%	4%	80%	10%	45%	33%	67%
<i>M. sinensis</i> 'Nippon'	0%	38%	30%	60%	43%	64%	0%	-
<i>M. sinensis</i> 'November Sunset'	0%	36%	0%	0%	-	0%	-	-
<i>M. sinensis</i> 'Positano'	32%	28%	6%	44%	88%	72%	-	-
<i>M. sinensis</i> 'Puenktchen'	0%	12%	0%	48%	-	72%	100%	0%
<i>M. sinensis</i> 'Purpurascens'	16%	60%	43%	52%	38%	79%	-	0%
<i>M. sinenses</i> 'Roland'	2%	36%	29%	16%	41%	84%	-	-
<i>M. sinensis</i> 'Rotsilber'	8%	44%	26%	68%	54%	76%	17%	20%
<i>M. sinensis</i> 'Sarabande'	7%	8%	0%	0%	-	47%	24%	0%
<i>M. sinensis</i> 'Silberfeder'	0%	0%	0%	48%	72%	60%	9%	60%
<i>M. sinensis</i> 'Silberspinne'	60%	8%	20%	72%	48%	52%	22%	-
<i>M. sinensis</i> 'Sirene'	0%	0%	18%	44%	76%	88%	-	-
<i>M. sinensis</i> 'Undine'	5%	12%	10%	40%	56%	52%	-	-
<i>M. sinensis</i> 'Wetterfahne'	-	0%	-	89%	-	-	-	0%
<i>M. sinensis</i> 'Zebinus'	0%	0%	-	-	60%	0%	0%	0%

¹ Where data is not provided, inflorscences were not available.

INVASIVE SPECIES UPDATE
Steve Castorani
Gateway Garden Center

It has been brought to my attention that there is confusion among members of the Delaware Nursery Industry concerning the production and use of potentially invasive plants. Let me try to clarify a few of these issues.

To my knowledge there are no plans by State or Federal officials to ban the production of commonly grown nursery crops at this time. You may be aware that there are various lists being developed and published by state, federal, and private organizations listing these potential invasive species. There are currently many species showing up on these lists that are raising a concern among people in the nursery industry. Many plants the industry has long been producing are on these lists. This should be of concern to you if you are currently growing and / or installing these items in the landscape. Currently, there are no plans in place to banish these plants from use or production without industry input. I believe this process will be lengthy, and radical recommendations will be met with resistance from our industry. I also do not know of any plans being developed to have these plants removed from private or public landscapes.

As Nursery Professionals, we need to be aware of these developments and their potential impact to our industry. In time, I feel the worst of these intrusive species may be either discouraged from use, or banned completely. The anxiety growers are feeling stems from not knowing what plants are being specifically targeted and on what timeline these changes are to take place. The DNLA and the ANLA will hopefully be keeping us informed of these events in a timely manner. A forum needs to be put in place to garner input from growers and evaluate the financial ramifications such a ban would

impose. Planning for a thoughtful, and well-calculated phase out of targeted items should be encouraged. This will help to ease the financial burden placed on growers.

We must also keep in mind the opportunities these changes will bring. There may be an opportunity for nursery growers to adjust their production and substitute non-invasive varieties. Many native and / or non-invasive varieties could be introduced as substitutes. If there is an eventual requirement to remove invasive plants from the landscape, the replanting of non-invasive species could give rise to a whole new market that would benefit designers, landscapers, and growers alike. Please use the following sources to educate yourself concerning this issue. I would also be happy to address your concerns personally. You can reach me at via e-mail at: steve@gatewaygardens.com Or by phone at: 302-239-4675.

Additional Articles:

Gilmer, M. 1996. Space Invaders. *American Nurseryman*, April 1, 1996.

Mountain, W.L. 1994. Purple Loosestrife, *Lythrum salicaria*. *Regulatory Horticulture*, Vol 20, No. 2, Fall 1994.

Parkhurst, J. 2000. The aliens are among us. *DNLA News*, Summer 2000.

Red Maple Threatens Forests in the East. *American Nurseryman*, April 1, 1999.

Reichard, S. 1999. Invasives Roundtable. *American Nurseryman*, July 15, 1999.

Reichard, S. 2000. Invasives Roundtable. *American Nurseryman*, February 15, 2000.

Scott, T. 2000. VNLA – invasive plant issues. *DNLA News*, Spring 2000.

PESTS, PLANTS AND POLITICS
Craig Regelbrugge
Director of Regulatory Affairs
American Nursery & Landscape Association

While invasive species like Asian longhorned beetles and zebra mussels usually garner attention from activists, government and the media, invasive plants are suddenly capturing the limelight.

What is the invasive plant issue, anyhow? Many of our most serious weeds were introduced – either intentionally or by accident – from other parts of the world. Some of the worst, such as yellow starthistle, have marched across public and private lands, particularly in the West. In the worst cases, these weeds or “invasive plants” have completely replaced naturally occurring vegetation and have even changed the functioning of whole ecosystems.

Conflicts over invasive plants and the role of horticulture are clashes of cultures and values. While naturalists often deem human impact as undesirable, horticulturists seek to find and bring back plants that are new, different and useful.

When some of the plants historically introduced for horticultural purposes have jumped over (or crept under) the garden wall, horticulturists have probably admired their tenacity. Indeed, many of the plants introduced by government or private interests to tolerate tough conditions and serve purposes like erosion control have sometimes done so too well. A handful of these plants have become seriously invasive. Whether or not we see this as a problem, folks concerned about natural areas do. They’re mobilizing – they’re clamoring for strategies to prevent new problems and struggling to manage existing ones.

Early in 1999, President Clinton issued an

Executive Order (EO) on Invasive Species. The EO directed federal agencies to coordinate actions to prevent and manage invasive species of all types. It also created an interagency council to oversee action. The Department of Interior, Agriculture and Commerce co chair the council. Finally, the EO called for a new federal advisory committee to provide input on an invasive species management plan. The first edition of that plan is due in August.

The American Nursery and Landscape Association (ANLA) sits as the only nursery/horticultural industry representative on the Invasive Species Advisory Committee and is one of just a few representing agriculture and business at a table of about 30 committee members. The rest represent diverse interests such as state agricultural, wildlife and fisheries agencies; scientists; and environmental groups.

With the August management plan deadline approaching, the working groups are tackling policy and regulation, risk analysis and prevention, management, research and information, communications, outreach and education, and international issues.

A range of strong, and sometimes extreme, views swirl about in the process. We still hope that a critical mass of reasonable people will keep the effort “steered toward the middle.” However, the communications group’s first draft holds some cause for alarm. It targets the nursery industry in several ways, calling for consumer education on planting natives instead of targeted, balanced messages on invasives and proposes mandatory nursery plant labeling schemes for plant origin and invasiveness potential. ANLA is providing comments that will hopefully get this draft back on track.

We expect strong pressure to regulate intentional new introductions of plants and other organisms. Currently, new horticultural

introductions are scrutinized mainly for their ability to harbor pests, not their potential to be pests themselves. ANLA is working with several groups to identify and test practical models for screening for potential invasiveness. If new regulation is unavoidable, we believe it must (1) be targeted at truly new species introductions rather than new cultivars of plants already existing in the U.S., (2) be reasonable and efficient and (3) allow for accreditation of qualified nongovernmental organizations and businesses to conduct the screening.

Proactive states like Massachusetts have assured the industry a seat at the table as they manage already-present invasives. They're working on criteria for ranking "accused" invasive plants and deciding what actions, if any, will be taken as a result.

In the end, the industry has a positive opportunity to impact the use of the right plants in the right places. The invasive species issue is not going to disappear, but the overall impact on the nursery and landscape business can be managed if we stay constructively engaged. If we don't, expect more regulation, polarization, and market-disrupting plant bans. The choice is ours.

GREEN INDUSTRY DROUGHT EMERGENCY PLANS Steve Castorani

As far as I can tell, the Green Industry drought emergency plans have been put on hold while our government changes administrations. During the past five plus years, I have been working with the Governors Office to have a Drought Emergency Plan in place that would keep our industry viable in the event of a prolonged drought. Unfortunately, the past administration was unwilling to make a decision and take the necessary action on our behalf. As frustrating as this process has become, it is still most important that the DNLA continues to pursue this agenda. The health and long term viability of our industry depends on it. More importantly the environment suffers when our planting efforts are regarded as non-essential. I urge all members to lend support to this cause.

This is a great time for us, as members of the DNLA, to lobby our new state government to support our industry's effort. I encourage all members to write our new Governor to make her aware of our plight. An effort should also be made to make your legislators aware of the consequences of this past indecision. Our industry is the fastest growing segment of agriculture. We must not delay the creation of appropriate drought regulations. We should also encourage Governor Minner to act on the development of a new sustainable supply of water for New Castle County. As legislation currently stands, another drought could doom our industry. Ultimately the Governor holds the power to implement water restrictions during a drought emergency. Please take this opportunity to make Governor Minner aware of the importance of supporting agriculture's future in Delaware.

Write to:
Office of the Governor
Tatnall Building
Dover, DE 19901

SOIL AMENDMENTS AND MULCHES IN TREE HEALTH MANAGEMENT

Harry A. J. Hoitink and M.S. Krause

Dept. of Plant Pathology

Ohio Ag Research & Dev. Center

Randy H. Zondag

OSU Extension

Composts and mulches can be used successfully to improve tree vigor and health. Unfortunately, these organic amendments also can be applied so that negative effects are the end result. Many factors contribute to success or failure in these soil organic management practices. This paper reviews the most critical factors that must be considered if mulches are to be used successfully.

Fresh vs. Composted Organic Matter

Most fresh plant materials cause negative effects on plant growth and/or health for some time after application. For example, fresh straw used as mulch increases water retention in soils; immobilizes nitrogen, resulting in poor growth; and may also increase *Phytophthora* root rot. Fresh ground wood seems to have similar effects

Composted yard waste prepared from ground wood and grass clippings has the opposite effect. It improves plant growth, improves both drainage and water retention, and can provide biological control of *Phytophthora* root rot. The same results have been obtained with composted tree barks.

In gardening, the type of organic matter used must be considered also. Vetch plowed into soil as green manure increases *Pythium* damping-off of lettuce if the crop is planted within the first week after plowing. However, 10 days after plowing, when the green manure is fully colonized by soil microorganisms, the disease is suppressed and biocontrol prevails.

Why do fresh amendments or mulches have these temporary negative effects on plant health? Fresh plant tissues, incorporated into soil, release sugars, proteins, and other water-soluble nutrients when they first begin to decay. This stimulates many plant pathogens as well as other soil microorganisms. Fresh organic matter undergoing high rates of decomposition also binds water, making it “slippery” when wet. The soil under mulch prepared from these materials remains too high in moisture content, and this can aggravate root rots.

As soon as the organic matter is partially decomposed and competition for nutrients begins among soil microorganisms, beneficial effects begin. Pathogens now are suppressed or killed, and beneficial microorganisms thrive, including mycorrhizal fungi. The structure of the soil is improved, which results in improved water retention under dry weather conditions and better drainage during periods of high precipitation. Soil fertility is affected also. While organic matter decomposes, nutrients are released and fulvic acids are formed. Fulvic acids are resistant to decomposition and polymerize to form humic substances in soils. Fulvic and some humic acids remain dissolved in water in soil early during the decomposition process. These acids chelate trace elements, such as iron, zinc, manganese, copper, etc., and improve the availability of these elements in soils. This is one reason why manures and sludges “green up” plants on some high pH soils.

Highly stabilized sources of organic matter, such as that in muck soils or peat, as well as humic substances in mineralized farm soils, do not provide these same beneficial effects. Pathogens typically cause heavy losses in such soils unless pesticides are used.

Are All Composts or Mulches Equal?

Composts prepared from yard wastes, manures, and sewage sludges tend to release significant quantities of nutrients for plant growth. They also may be high in salt content, which can present problems. These products need to be applied based on the fertility requirement for the crop. However, since the nutrients are released over several years, large amounts can be applied relative to the same amounts of nutrients in manufactured fertilizers. One half bushel of these products per tree gives positive effects on tree crops for the reasons given previously.

Composted manures and sludges contain large quantities of fine particles and tend to encourage germination of weed seeds. These types of materials should be incorporated into the soil during planting. They are not ideal when used as mulches. Coarser products should be used as mulches.

Hardwood bark and hammer milled pallets, etc., tend to consist of large particles, and these products immobilize nitrogen unless composted first. The best procedure is to nitrify this material with manure or composted sewage sludge (15% by volume), poultry manure (30 to 60 lbs/cubic yard), or urea (2 lbs/cubic yard). It should then be composted in windrows at temperatures of 120 to 140 F at 50 to 70% moisture content for six to eight weeks. This large-particle composted product is very effective, if applied as a mulch at a volume of one or more bushels per tree.

Composted yard wastes also enhance soil fertility and have provided some biological control of diseases caused by several soilborne plant pathogens. The fine particles (less than one inch in diameter) screened out of composted yard waste make excellent soil amendments for topsoil preparation. The coarse fraction (greater than one inch in diameter) makes excellent

mulch that has long-lasting beneficial effects.

Optimum Depth of Mulch Layer

Most mulches need to be applied at a two-inch depth to provide weed control. Some landscapers apply mulches to a depth of four to six inches. Wood chips applied to a depth of four inches decrease the colonization of trees by mycorrhizal fungi as shown in a reforestation trial in Alberta. A two inch-deep layer enhanced tree establishment and colonization by mycorrhizal fungi over the control in that work. Many reports have shown that mycorrhizal fungi are stimulated by organic amendments if the correct amount of material is applied, and this also promotes plant health and vigor.

Some mulches, as mentioned earlier, can be very high in nutrient content and salinity. Composted manures and yard wastes, for example, may contain up to 1% potash on a dry-weight basis. The nutrients in these materials must be considered or toxicity may result. Fertility guidelines must be followed for these materials.

How Long Do Effects Last?

The effect of a two-inch layer of composted hardwood bark lasts well into the third year. The lignin (dark material) and waxes in bark resist decomposition, and this is the reason for the long-term effect. Composted yard wastes break down much more rapidly because the principal material is cellulose, which decomposes readily. A two-inch-deep layer of such mulch lasted well into the third year on strawberries at The Ohio State University and lasted through three years in a mulch study on trees in nurseries.

Composted manures and green manures decompose even more rapidly and should be incorporated into the soil. The length of time

that each product lasts depends on the chemistry of the original material and many other factors.

Summary

Mulches and composts, if used properly, provide beneficial effects through any of several mechanisms. It is best to apply composted products. Raw products should be applied in the late fall or winter. Do not apply more available mineral nutrients in the mulch than the amount required for the crop. Compost or manure analysis complete with soil analysis and crop need should form the basis for application rates. The frequency of application varies from crop to crop and product to product. It is most important to use these products when trees are first planted.

Reprinted from the June 2000 ONLA's BUCKEYE.

Job Opportunity

Deerfield Golf & Tennis Club in Newark, DE has a full time position available for a gardener. The starting salary will be commensurate with education and experience. Corporate benefits include (401K, pension, health insurance, dental, vision, etc.)

The clubhouse gardener reports directly to the golf course superintendent. He/she is responsible for the upkeep of the grounds, walks, and parking lots around the clubhouse, Rankin house, cart barn, tennis courts, and entrance to course.

Contact Paul Stead, Certified Golf Course Superintendent at 302-452-5954.

For full job description, call Dot Milsom at 302-831-2531.

EFFECTS OF DROUGHT ON WEED MANAGEMENT

Steven Dewey
Utah State University

Have you even noticed that weeds seem more abundant or more difficult to control under dry conditions? Well, it's not just your imagination. Many weeds have developed ingenious ways to survive and even thrive under conditions that would kill many other plants. When drought conditions persist, many desirable plants are weakened or even killed, and weeds fill in the spaces. Why are some weeds able to cope so well with drought? Some have unusually long roots that permit them to reach water stored deep in the soil where some desirable plants can't reach (i.e. leafy spurge, field bindweed, and Russian knapweed). Some weeds keep their extensive root system in the top few inches of soil and absorb water very quickly, essentially giving them first rights to any precipitation (i.e. downy brome, kochia, and yellow star thistle). When rainfall is light and infrequent, there is often none left over for plants with deeper roots. Other weeds can become dormant during extreme heat and drought - a little bit like hibernating - allowing them to avoid the harsh effects (i.e. hoary cress and quackgrass). Still other weeds are able to germinate, grow, and produce seeds very quickly, taking advantage of scarce precipitation and completing their life cycle before other plants (i.e. Russian thistle, shepherd's purse, and wild mustard). Whatever the reason, weeds usually win in the battle for limited resources like water.

Drought can also affect the performance of many herbicides. Soil-active herbicides normally need precipitation to move into the soil where they can be taken up by weed roots. If the soil is dry and no precipitation occurs, herbicides may remain on the soil surface, ineffective and vulnerable to loss. To minimize the effects of drought on soil-applied herbicides,

mechanically incorporate the materials shallowly as soon as possible after application.

Foliage-active herbicides also are frequently affected by drought. Dry soil and air conditions make it especially difficult for herbicides to get into plants and move about because they adversely affect absorption and translocation. Foliar absorption refers to the passage of herbicide molecules from the outer surface of a leaf, through the protective covering called the cuticle, and into the living cells inside the leaf. Cuticles are layers of waxes and resins that cover the surface of all leaves and stems of most plants to protect them against excessive evaporative water loss. Cuticles typically become much thicker and more difficult for herbicides to penetrate when drought conditions exist. Absorption of some herbicides can be improved under drought conditions by adding adjuvants listed on their labels.

Translocation is the movement of herbicides through vascular tissues to various places within a plant. When weeds are stressed by drought, herbicide translocation is often affected, moving more slowly and perhaps not as far as if applied under good moisture conditions. Because control of perennial weeds from a foliar-applied herbicide depends on translocation to distant roots or rhizomes, it's no surprise that control can be reduced.

As a general rule, herbicides work best if applied when environmental conditions are favorable for plant growth. Whenever possible, avoid applying herbicides when weeds are under stress. Always read and follow all label instructions regarding environmental conditions that can affect the performance of the herbicides you use.

Excerpted from Roadsides, An FHWA Quarterly Newsletter for Roadsides Decision-Makers, Summer-2000

LEAVE 'EM LIE
Keeping clippings on the lawn is part of
proper maintenance
Patrick White

For decades, debate has swirled within the green industry about the pros and cons of removing grass clippings as part of regular mowing and maintenance practices. The once common act of leaving the clippings in place eventually produced complaints from homeowners as society became more and more concerned about the aesthetics of the prized suburban lawn. In response to changing demands, lawn mower manufacturers (both commercial and homeowner) began producing mowers that bagged clippings. This resulted in immaculately swept turfgrass areas, but also added massive amounts of clippings to already clogged landfills. What's more, lawncare professionals were forced to increase fertilizer applications to compensate for the elimination of the natural nitrogen previously provided gratis by the clippings themselves.

As the garbage bags and fertilizer bills piled up, it became apparent that a new approach was needed – one that balanced the amount of nitrogen the grass received with the size and amount of clippings produced. In theory, the balance goes something like this: Apply the right amount of nitrogen, set the proper mowing height, mow at the correct intervals (with a mulching or conventional mower) and it should be possible to generate clippings of such size that they can be left in place without scarring the scenery, while at the same time helping to fertilize the lawn. That theory was proven correct thanks to a recent field experiment at the Rutgers Turfgrass Research Center.

This research sheds light on the issue of clippings and provides ammunition for lawncare professionals to use in educating clients on the

beneficial aspects of leaving them where they belong – on the lawn. The issue, however, is more complex than simply allowing clippings to remain on the turfgrass. To realize the benefits of this practice, the Rutgers researchers make clear, those caring for the lawn must institute and follow a comprehensive turf maintenance plan, paying particular attention to fertilization and mowing practices.

The Rutgers experiment was conducted using a plot of mature Kentucky Bluegrass planted on a loam soil. Researchers applied nitrogen in several different forms and quantities to different areas of the test plot. These included rates of 0, 2 and 4 pounds per year on a quarterly basis of both quick-release and slow-release nitrogen fertilizers. Mowing was also varied, with both mulching (clippings remain) and bagging (clippings removed) mowers used on different areas on a weekly basis. As part of the research, both weeds and turf color were monitored before, during and after the experiment to determine the effects of fertilization, mowing and clipping practices on the quality and health of the turfgrass.

By comparing results within the different areas of the test plot, Rutgers researchers were able to determine which practices (and combination of practices) produced the best results. In the report produced on the matter, those involved in the study write: “Our research shows that when 2 pounds of nitrogen (per 1,000 square feet per year) are applied, 38 pounds of dry clippings were produced versus 58 pounds of dry clippings when 4 pounds of nitrogen were applied.” In other words, when the nitrogen application rate is cut in half, from 4 to 2 pounds, the clippings are reduced nearly in half as well. A savings of 20 pounds of grass clippings over 1,000 square feet may not seem like a lot, but because these weights are dry, they must be multiplied by six to demonstrate the amount of fresh clippings generated.

Therefore, a savings of 120 pounds of wet clippings were noted.

In addition to revealing that reduced nitrogen rates would considerably reduce clippings, the Rutgers research found that, “Even with half as much nitrogen fertilizer applied, turf color was generally better where clippings were returned as compared to where they were removed.” The study found that only early in the growing season (May), did the higher nitrogen applications produce greener turf.

In addition, the Rutgers study showed that, “Weed populations were significantly reduced where clippings were returned.” Part of the explanation for this finding is that the clippings contribute an estimated 1 to 2 pounds of nitrogen per 1,000 square feet, helping to offset the reduction in applied nitrogen and keeping the lawn dense enough to fight off the invasion of weeds. This fertilization balance, along with proper mowing practices, produced healthy turf while minimizing the size and quantity of clippings left.

The final conclusion, according to the report produced on the research, is that “Leaving clippings recycles nutrients and results in better turf color than removing clippings.” It should be noted that excessive clippings can be detrimental to turfgrass, as they can exclude light. The researchers also note that a regular (weekly) mowing schedule is essential to maintain the clippings at reasonable levels, and this mowing frequency is not always feasible in real-world situations. However, the Rutgers research shows that leaving clippings in place not only can prove beneficial, but is actually the best strategy for producing an attractive, healthy lawn.

Reprinted from TURF NORTH, September 2000.

**A SUMMARY OF THE NUTRIENT
MANAGEMENT PLANNING PROCESS
FOR NURSERY AND GREENHOUSE
OPERATIONS IN MARYLAND**

**John Lea-Cox, David Ross, Marc Tefteau
University of Maryland.**

Many growers are now gearing up to write nutrient management plans in the near future. Here is a synopsis of the nutrient management planning process that we are now implementing for nursery and greenhouse operations in the State of Maryland.

The strategy is different for Field production versus ‘Out-of-Ground’ production. For field producers, nutrient management plans will be written more along the lines of agronomic plans, where ‘management units’ are more logically based on blocks of plant species with similar growth rates and/or by soil type. Field management plans will be based on soil tests for available P combined with ‘yield production goals’ based on the time taken to produce a particular plant species or a specific caliper size.

For ‘Out-of Ground Producers’, the nutrient management planning process is a two or three-step process, depending on how you fertilize and irrigate your plants. This is because soilless substrates do not hold nitrate and phosphate, and we have to formulate effective strategies to retain water and nutrients in the container and minimize leaching.

This process also involves a different kind of strategy that is based on risk assessment. We recommend that container operations base their management units on whether they grow annuals, foliage or indoor plants, herbaceous or woody perennials. Within each of those plant categories, we have three or four specific management units, based on container size. All in all, most producers would likely have less

than six management units to assess in total. The first step in the ‘Out-of-Ground’ nutrient management planning process is assessing where water flows to on site:

- For growing areas flowing to containment structures, we calculate the size and the condition of ponds or containment areas, to determine if maximum daily irrigation volumes are greater or less than 90% of that containment capacity.
- For areas not flowing to containment structures, we measure width and assess condition of riparian areas and the type of surface water flow (spread to sheet flow, or channeled e.g. by a ditch).

We then determine the risk based on whether you are above or below containment capacity or riparian buffer criteria, according to the criteria already listed in the regulations.

Then, for operations that only use slow-release fertilizers and use ‘clean’ water to irrigate their plants:

For each management unit, we:

- Calculate the fertilization rate (incorporated + topdress applications) to provide quarterly/annual N-P-K applications totals per acre of growing space);
- Measure the leaching fraction of the container and the substrate used in production (to determine leaching potential) under standard irrigation conditions;
- Then determine the risk of nitrogen and phosphorus leaching from the site, based on the fertilizer formulation, the fertilizer application rate combined with the irrigation frequency and the leaching

fraction of the substrate.

For operations that use slow-release fertilizers and/or soluble fertilizers, the process is slightly more complicated, as we have to calculate the amount of fertilizer that falls between plants (if you are using overhead irrigation):

For each management unit, we:

- Calculate the fertilization rate (both slow-release and soluble) to provide quarterly/annual N-P-K applications totals per acre of growing space;
- Calculate irrigation system efficiency, as plant spacing becomes important with overhead or boom irrigation systems;
- Measure the leaching fraction of the container and the substrate used in production (to determine leaching potential) under standard fertigation conditions;
- Determine the risk of leaching based on the fertilizer formulation, the application rate, the irrigation frequency, the plant density (interception efficiency) and the leaching fraction.

Since container size integrates many of the fertilization, irrigation and substrate variables associated with 'out-of-ground' nursery crop production, we feel that the container size management units are the key to assessing the efficiency and the leaching potential of these operations. Further information about the nutrient management planning process for nursery and greenhouse production in Maryland can be found at:

<http://www.agnr.umd.edu/users/nutrient/nursery/home.htm>

Reprinted from Free State Nursery News, August 2000.

PREPARING FOR WINTER STORAGE

With fall and winter quickly approaching, there isn't a lot of time to procrastinate when preparing equipment for winter storage. Here are a few tips to make sure your equipment will operate like new next spring:

- Add a fuel stabilizer and run the engine for about 10 minutes or run the fuel tank dry. Fuel only has a shelf life of about 30 days before it begins to break down. If not treated properly, this leftover fuel can varnish the carburetor causing the engine to surge.
- Change the oil and oil filter. Dirt and other contaminants can settle and cake onto the engine sump.
- Service the air cleaner if necessary.
- Remove the spark plug. Put one ounce of oil in each cylinder. Reinstall the plug, but leave the plug wire off. Crank or turn the engine five or six times.
- Remove the battery. Clean the battery and charge as necessary. Then store in a cool, dry place where it won't freeze.
- Clean off all debris and paint any scratched or roughed up areas to prevent rust and corrosion. It's also a good idea to spray unprotected surfaces with a protective spray such as Fluid Film.
- Lubricate per the operator's manual.
- Relieve hydraulic pressure if necessary.
- Store unit in a dry place or cover unit to protect it from the elements.

THE GOOD GUYS VS. THE BAD GUYS: CAN LACEWING PREDATORS CONTROL LACE BUGS?

Paula Shrewsbury
Extension Specialist in Ornamental IPM,
University of Maryland

Azaleas are one of the most commonly grown plants in production nurseries and landscapes in the mid-Atlantic region. Azalea lace bug, *Stephanitis pyrioides*, is a key insect pest of azaleas. Lace bug infestations result in a loss of aesthetic appeal, reduced plant vigor, premature leaf drop, plant death, and economic loss for growers. Current control tactics for azalea lace bug emphasize the use of chemical insecticides.

With increasing societal concerns over the effect of pesticides on the environment and human health and increasing government regulations of pesticide use, there is a need to develop efficacious and cost effective alternative pest management approaches. One of the most promising approaches to managing insect pests in landscapes and production nurseries is biological control, the use of natural enemies to suppress pest populations below damaging levels. In an intensive production nursery situation, however, natural enemies are often absent or not abundant enough to suppress pest populations below damaging levels. When existing natural enemies are scarce, augmentative biological control is a viable pest management option. Augmentative biological control is the release of insectary reared or commercially available natural enemies for suppressing pest populations. However, the use of biological control has yet to be demonstrated as a viable, economic option for production nurseries.

The studies discussed herein were conducted to examine the use of augmentative biological control as an alternative approach for managing azalea lace bug in production nurseries. The

green lacewing, *Chrysoperla carnea*, was selected as the biological control agent for this study because it is frequently found in landscape habitats in association with azalea lace bug, preliminary laboratory studies demonstrated green lacewing larvae feed on azalea lace bugs, green lacewing larvae are voracious predators, and lacewings are one of the most widely available natural enemy species from commercial suppliers. The objectives of this study were to: 1) evaluate the effectiveness of green lacewings to suppress azalea lace bug populations; and 2) to develop guidelines for the effective use of green lacewings as a biological control for azalea lace bug in production nurseries.

Two trials were conducted. The first compared the effectiveness of two release rates of green lacewing larvae with acephate (Orthene) in reducing azalea lace bug populations on container grown azaleas. Lace bug survival in the lacewing and acephate (Orthene) treatments was significantly reduced compared to the control (see Figure 1). Green lacewing larvae released at rates of 5/plant and 10/plant and acephate (Orthene) reduced azalea lace bug densities by 79, 88, and 100%, respectively.

A second study was performed in a production nursery where blocks of container grown azaleas were used to evaluate the effectiveness of green lacewing larvae in suppressing azalea lace bug densities when lacewings were released using a "tapping" method. Commercially purchased lacewing larvae are shipped in cardboard hexal units. To release green lacewing larvae onto azaleas, the mesh cloth on one side of the hexel unit was gradually peeled back as the unit was held and moved over the azaleas and "tapped" to knock lacewing larvae onto the plants. Green lacewings reduced azalea lace bug populations by 97%. Release ratios (lacewing: lace bug) in this study average 1:2.6 and ranged from 1:1.2 to 1:4.1.

This study was designed to simulate container nursery conditions and examine an alternative control tactic for use in production nurseries. The use of augmentative biological control and the “tapping” method used to release green lacewing larvae was found to be effective and practical for this particular production nursery situation. In this nursery, monitoring determined that a small subset (approx. 250) of containerized azaleas were infested with damaging levels of azalea lace bug. Lacewing larvae were purchased, released, and greater than 95% control was achieved. This study suggests that augmentative biological control of lace bugs may be appropriate in nurseries where “hot spots” of lace bugs have been identified. However, augmentative release of green lacewing and the “tapping” release method may not work in all situations.

There are several factors that will likely limit wide spread use of green lacewings for managing lace bugs in production nursery systems at this time. For example, relatively low densities of lace bugs can result in intolerable levels of aesthetic damage to azaleas.

Low thresholds for lace bug damage would require high release rates of green lacewings resulting in higher costs for lacewing predators. In addition, these studies and others have found that green lacewings disappear from the production crop when pest populations decline. The implication of these results is that lacewings should not be expected to give season long control and that multiple releases of integration with other management tactics may be necessary for effective management of lace bugs and other pests. These higher costs and additional management inputs make it difficult to justify augmentative biological control when systemic chemical controls, such as acephate and imidicloprid, are available and provide long term suppression of lace bugs. However, with increasing societal and regulatory pressure to reduce pesticide inputs, it is imperative that we continue to explore and develop augmentative biological control and other alternative control options.

Reprinted from MD Nursery News – Winter 2000.

CANKER ON LEYLAND CYPRESS

In recent years Leyland Cypress (x *Cupressocyparis leylandii*) has gained popularity as a fast-growing addition to the home landscape. It has been touted as a low maintenance tree, but this is not always the case. It is often over-planted in areas to which it is not well adapted and it is not well maintained. As Austin Hagen, Extension Plant Pathologist, and professor at Auburn University explains, “Such trees, when exposed to prolonged drought or extreme cold are predisposed to attack by stress-induced plant diseases. The net result is that Leyland cypress in landscapes across the south are dropping like flies.”

Of particular concern in Virginia is the Seridium canker. In their article entitled *Diseases of Leyland Cypress*, Ronald Jones, Mike Benson, and Larry Grand of the pathology department at NCSU explain:

“This canker is caused by several species of fungi (*Seridium cardinale*, *S. unicolorne*, and *S. cupressi*)... Seridium cankers form on stems, branches and in branch axils causing dieback of leading and lateral shoots. Twig dieback has also been observed with a gray discoloration at the point of infection. Major diagnostic features include resin oozing from cracks in the bark, dark brown to purplish patches on the bark, sunken cankers with raised margins, and yellow to brown discoloration of foliage above the canker. However, resin ooze on the stems of Leyland cypress has frequently been observed in the spring in North Carolina on otherwise healthy trees. Sport producing structures of the fungus appear on the bark surface as small circular black dots about the size of a pencil lead. Spores of the canker fungi are washed down the tree, or splashed from tree to tree by rain or overhead irrigation. New infections develop when spores lodge in bark cracks, wounds and branch axles. Spores can also be

moved from plant to plant on pruning tools. Movement of the fungus over long distances appears to be through the transport of infected cuttings and plants.”

To control the spread of this fungus, Mary Ann Hansen of the Plant Disease Clinic at Virginia Tech recommends that you remove and destroy severely diseased trees, especially if there is evidence of the canker on the trunk. Wilted or discolored branches and tips should be pruned out and destroyed. Ms. Hansen notes that browning on the branches does not mean that the trunk has been attacked and the tree is doomed. However, there is still a possibility that the canker can spread to the trunk. All tools should be sterilized before and after use by dipping in a solution of one part chlorine bleach and nine parts water, or by dipping in rubbing alcohol.

Currently there are no fungicides that have been cleared for the control of Seridium canker on Leyland cypress. However, in his article entitled *Canker Diseases of Leyland Cypress*, Mr. Hagan recommends minimizing the impact of moisture and/or temperature stress on tree vigor by establishing proper management practices. Avoid closely spaced screens in the landscape, and during prolonged drought, soak the soil every five to seven days around the base of the trees.

More information is available on Seridium canker at the following sites:
<http://www.arborman.com/seridium.htm>, and
<http://www.ces.ncsu.edu/depts/pp/notes/oldnotes/od17>

Reprinted from THE VIRGINIA GARDENER, September/October

Publications

The Color Encyclopedia of Ornamental Grasses. Timber Press announces this publication is now available in a CD-ROM version. This electronic version of the critically acclaimed work by Rick Darke includes nearly two dozen new plants and over 200 color photographs not found in the hardcover version. The company also announced that three popular garden guides by Patrick Taylor – *The 500 Best Garden Plants*, *Gardening with Bulbs*, and *Gardening with Roses* – are back in stock. The books had been unavailable for some time. For information about the books or the CD-ROM, call Timber Press at 800/327-5680 or visit its Web site at www.timberpress.com

Woody Ornamental Insect, Mite and Disease Management. Penn State Cooperative Extension. This 85-page book is hot off the presses. There are two main sections—insects & mites and diseases. Within each section, common landscape plants are listed with the problem insects or diseases found on that plant listed below. Control recommendations include both cultural and chemical controls. For ordering information, call 814-865-4700.

The Healthy Indoor Plant, A Guide to Successful Indoor Gardening, Charles C. Powell, Rosemarie Rosetti. 304 pages, large-format, spiral-bound paperback with 140 photos and illustrations. This book satisfies the need for a text devoted entirely to indoor ornamental horticulture. This comprehensive volume used a holistic approach to provide accessible information about the healthy management of plants being kept indoors for long periods of time. ISBN 1-57766-1575-5. Price: \$29.95 plus \$4 shipping. Waveland Press, Inc. PO Box 400, Prospect Heights, Illinois 60070. Phone: (847-634-0081. www.waveland.com

Greenhouse Engineering, NRAES-33. This 212-page publication covers the various aspects of greenhouses, from site selection, layout, and growing systems to construction, remodeling, and environmental control. The comprehensive appendix includes a list of greenhouse construction and supply companies; plans for greenhouses; and information on topics such as heating and cooling, container capacity, and labor output. Cost \$30 each plus \$5.50 shipping. NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information contact NRAES (607)255-7654, by fax (607)254-8770, nraes@cornell.edu or web site www.nraes.org

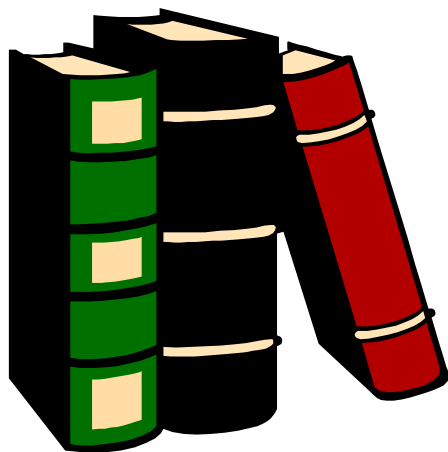
Best Management Practices, Guide for Producing Container-Grown Plants. This 76-page, 4-color handbook offers guidelines for implementing proactive management practices necessary to produce container-grown plants with minimal environmental impact and addresses such issues as Container Management Practices and Container Nutrition Practices. It establishes a site specific menu of management practices that can be implemented regardless of nursery size or location and promotes environmental stewardship among container plant producers. Also includes a 10-pg, laminated summary of BMP's designed for in-field use. Cost is \$30 for VNA members and \$0 for non-members. For more information contact: Virginia Nursery/Landscape Asso., 393 Coal Hollow Rd., Christiansburg, VA 24073-6721. Phone(1-800-476-0055, fax: 540-382-2716, email: vna@swva.net

Human Resource Management for the Green Industry. A new resource to help you recruit, manage, and motivate employees. Chapters cover recruiting a top-notch staff, welcoming the new staff member motivating staff, measuring performance, handling difficult situations, legal considerations, and safety in the

workplace. #A-40030-2/Available April 2000/aprox. 200 pages paperback plus IBM Microsoft Work disk. Cost \$93.75 for ANLA members; \$125 for non-members + \$5.75 shipping. For more information fax #202-789-1893/or call (202)789-5980, ext. 3019.

Pot-In-Pot Resources. Bibliography by John Ruter and Sven Svenson. Get their excellent publication directly at the following url <http://www.ca.uky.edu/HLA/Dunwell/PnPRSlit.html> or by going to Nursery/Landscape Industry then to Types of Production and click on Pot-in-pot where you can also find *Physical and Economic Requirements for Pot-in-pot Nursery Production* by Dr. Robert McNiel, et. Al. A hardcopy can be gotten by calling Christi (270)365-7541, ext 221 or e-mail to wdunwell@ca.uky.edu

Herbaceous Perennials Production: A Guide from Propagation to Marketing. By Dr. Leonard Perry of University of Vermont Cooperative Extension. Cost \$27 each plus \$5.50 shipping. NRAES, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, NY 14853-5701. For more information contact NRAES (607)255-7654, by fax (607)254-8770, nraes@cornell.edu or web site www.nraes.org



Pesticide News

Insecticides:

The government will announce a ban today (12/6) on the insecticide diazinon, the last widely used pest-control product made from a class of chemicals linked to health risks for children.

The Environmental Protection Agency (EPA) has reached a voluntary agreement with diazinon's chief manufacturer, Syngenta, to phase out all home and garden applications of the pesticide over the next four years, according to sources familiar with the deal.

CHIPCO 60818 (fipronil) – Rhone-Poulenc -A new formulation developed to control fire ants, thrips and fungus gnats on ornamental trees, shrubs and flowers.

ENDEAVOR 50WG (pymetrozine) – Novartis – A new insecticide being developed for use on ornamentals to control aphids and whiteflies.

MAVRIK (fluvalinate) – Wellmark – Due to registration requirements they have deleted from their label the usage on commercial and residential turf. Unless withdrawn this will be effective on 2-22-2000. (FR Vol. 64, 8-25-99).

MERIT (imidacloprid) – Bayer – Added to their label the control of cutworms.

VISION (cyfluthrin/imidacloprid) – Bayer – A combination insecticide being marketed to the home and garden market to control various insects on lawns and ornamentals.

DIAZINON (Novartis) – Due to the high cost of re-registration the company will not support indoor applications which will eliminate uses in greenhouses, residential settings, commercial

buildings, hospitals, schools, museums, sport facilities, stores and warehouses.

MESA (milbemectin) – Gowan – this new miticide developed by Sankyo of Japan will be developed and marketed in the U.S. by Gowan. It is a mixture of naturally derived products insolated from a fermentation broth of soil microorganisms. Evaluation is being done on pome fruit, citrus, strawberries and ornamentals.

PRISTINE RTU (acetamiprid) – Aventis – A new insecticide being developed for homeowner use to control aphids, whiteflies, flea hoppers, leaf hoppers and other insects in various fruits, vegetables and ornamentals.

RIMON 10 EC (novaluron) – Makhteshim – Agan – a new product to control whiteflies, thrips, leafminers and armyworms in ornamentals grown in greenhouses or outdoor nurseries.

SCIMITAR (lambda cyhalothrin) – Zeneca – Added to their label the usage on ornamentals commercially grown in greenhouses and nurseries.

THIAMETHOXAM – Norvartis – this new insecticide whose registration is expected this fall will be sold as Meridian in the turf and ornamental market and Flagship in the greenhouse and nursery market. It is expected to be registered for structural pest control in 2001.

Herbicides:

TRUPOWER (MCPA/bromacil/clopyralid) – Riverdale – A new turf herbicide designed to control hard to kill broadleaf weeds.

CONSAIR (chlorsulfuron) – Riverdale – A new formulation being developed to control various weeds in turf.

Fungicides:

COMPASS 50WG (trifloxystrobin) – Novartis – A new fungicide being developed for use on ornamentals to control powdery mildew and rusts.

COUNTDOWN (chlorothalonil) – Zeneca – A new formulation developed for use on vegetables, fruit trees and ornamentals to control various diseases.

MEDALLION (fludioxonil) – Novartis – Additions to their ornamental label include the control of myrothecium and cercospora as a foliar spray and the control of fusarium, cylindrocladium and sclerotium as a soil drench.

CURALAN (vinclozolin) – BASF – New labeling will remove the usage on commercial turf and sod farms, and woody and herbaceous plant production.

FIRST STEP (potassium bicarbonate) – Cleary – a new product being developed for the ornamental market to control powdery mildew, Botrytis and other diseases.

INSIGNIA (pyraclostrobin) – BASF – a new fungicide being developed to control brown patch, gray snow mold, pink snow mold, rust, summer patch and leaf spot on turf.

Research Briefs

Propagation:

Storage of tissue culture propagated hosta plantlets. To be more flexible in responding to consumer demand and labor resources it is sometimes desirable to store tissue culture propagated hosta plantlets. Light is recommended during storage and sucrose must be supplied in the medium to maintain high quality plantlets. Optimal temperature for storage of hosta plantlets is 10-22 C. (S.B. Wilson, N.C. Rajapakse and R.E. Young)

Excerpted from HortScience: 35(6):1159-1162. 2000.

Propagation of *Berberis* 'Baisel' (Golden Barberry). 'Baisel' can be successfully propagated from softwood cuttings in early summer with solutions containing 1250 IBA. Rooting, leaf retention and overall foliar color was improved as shade levels increased. (B.H. Murphree, J.L. Sibley, D.J. Eakes and J.D. Williams)

Excerpted from HortTechnology, October-December 2000, 10(4):752-753.

Greenhouse Production:

Only minimal Phosphorus required. Container grown plants in this study (foliage plants, marigolds, tomato, bell pepper and pentas) required only minimal amounts of P for optimum growth and applications of high P fertilizers did not promote wither root or shoot growth. In fact, relative root growth actually decreased or stayed the same with increased P fertilization. Thus there is no advantage to using high P fertilizers in the production of these crops. (T.K. Borschat and K. A. Klock-Moore)

Excerpted from HortTechnology, October-December 2000, 10(4):765-767.

Field Production:

Nitrogen fertilization for Frazer fir. Time of application of N was not critical. A rate of 26 g/tree (approx. 1 ounce) was sufficient for most of the growth indices. (L.E. Hinesley, L.K. Snelling, C.R. Campbell, D.K. Roten and J. Hartzog)

Excerpted from HortScience: 35(5):860-862. 2000.

Landscape:

Cool season turfgrass establishment. August or September is the optimum time to establish cool-season grasses. Dormant-seeding Kentucky bluegrass and tall fescue in November, December, or March will hasten establishment compared with spring seeding. Later fall or dormant-seeding perennial ryegrass might not be justified because of winterkill potential. Varying the rate of N and P applied to the seedbed on fertile soils did not affect establishment regardless of seeding rate. (J.J. Reicher, C. S. Throssell and D.V. Weisenberger)

Excerpted from HortScience: 35(6):1166-1169. 2000.

Tolerance of fescues to annual bluegrass herbicides. Turf-type tall fescue, hard fescue, chewings fescue and blue sheep fescue are replacing perennial ryegrass on some fairways in the mid-Atlantic region. Tests with herbicides used to control annual bluegrass (ethofumesate and prodiamine) show that the fescues generally tolerated one November application of ethofumesate at 1.12 kg/ha. Prodiamine applied preemergence in early to mid-September at

greater than or equal to 0.36 kg/ha provided excellent control of annual bluegrass in MD and all fescues in the study tolerated prodiamine at 0.73 kg/ha. Fescues could also be treated relatively safely with ethofumesate tankmixed with prodiamine. (P.H. Dernoedon)

Excerpted from HortScience: 35(6):1170-1173. 2000.

New Releases:

New sugar maple cultivars released. A distinct population of sugar maples in Caddo County, Oklahoma has shown greater adaptability to the temperature, wind and rain extremes of the southern plains. Caddo maples, since they come from a southern ecotype, tend to color very late in the fall. After 10 years of evaluation, two Caddo maples with unusually early fall coloring were selected. ‘John Pair’ has noticeably superior, early fall, red to grayed red fall color. It is slower growing than other Caddo maples but has a very formal, broad, oval growth habit with a dense crown of broadly ascending branches. ‘Autumn Splendor’ has the earliest fall color—yellow-orange to red. It has an upright oval growth habit with ascending branches and is more columnar than ‘John Pair.’ The growth is vigorous. Both cultivars have excellent drought tolerance and resistance to leaf tatter. Propagation of both cultivars is by T-budding. Both cultivars have been propagated and distributed for testing to commercial nurseries (Bailey Nurseries, Inc., J. Frank Schmidt & Son, and Spears Nursery). Further inquiries and requests for scion wood should be referred to Michael Shelton, John C. Pair Horticultural Research Center, Haysville, KS 67060-8351. (A. LeDuc and J.C. Pair)

Excerpted from HortScience: 35(5):970-971. 2000.

Plant Pathology:

Dicentra, Epimedium, and Heuchera: New Perennial Ornamental Hosts of Tobacco rattle virus in the United States. Yellow ringspotting and concentric line patterns in plants of *Dicentra* (bleeding heart), *Epimedium* (barrenwort), and *Heuchera* (coral bells) from commercial nurseries and home gardens in Minnesota, Michigan, and Massachusetts were associated with infection by Tobacco rattle virus (TRV), which was identified by particle morphology, enzyme-linked immunosorbent assay and immunosorbent electron microscopy. This is the first report of TRV occurrence in *Dicentra* in the United States and the first report of TRV occurrence in *Epimedium* and *Heuchera*. In previous reports we have called attention to the increasing incidence of TRV in vegetatively propagated perennial ornamental plant species in the United States and to the potential for virus spread to crops such as potato, in which TRV has not been reported in the Midwestern United States. It is possible that increased international trade in vegetatively propagated ornamental plants may be resulting in the introduction of TRV and other exotic viruses into the United States and elsewhere. It is also possible that the natural occurrence of TRV in North America may be actually more widespread than has been reported. (B. E. L. Lockhart)

*The preceding edited report (Plant Dis. 84:000, 2000) documents the presence of tobacco rattle virus in new perennial hosts in the U.S. I have seen ringspotting symptoms as described here in several Delaware plantings of Epimedium.—
Bob Mulrooney*

Calendar

December 12 and 19 – Landscape Maintenance Estimating and Bidding Workshop. Held at: Penn State – Great Valley Campus, from 10:00 am. – 4:00 pm. Pre-registration is required, cost \$75. Contact Penn State Coop. Ext.-Bucks County, Neshaminy Manor Center, 1282 Almshouse Rd., Doylestown, PA 18901.

December 19 – Pest Management Conference for Recertification for Pesticide Applicators in MD, DC and VA. Montgomery College, Germantown, MD. Contact: Suzanne Klick (301)596-9413.

January 2-5 – Northeastern Weed Science Society Annual Meeting. “Invasive Plants: The Issue for the Next Decade.” Boston Marriott Cambridge, Cambridge, MA Contact Jeffrey F. Derr, Virginia Tech, Hampton Roads AREC, 1444 Diamond Springs Road, Virginia Beach, VA 23455; tel. (757)363-3912; fax 757-363-3950; e-mail jderr@vt.edu

January 4 – Winter & Spring, Educational Programs for the Green Industry. Retail Marketing, PSU-Berks Campus. Contact: John Berry (610)391-9840. Penn State College of Agricultural Sciences: <http://www.cas.psu.edu>

January 8-12 – Advanced Landscape IPM Short Course. University of Maryland, College Park, Plant Sciences Building. Call (301)405-3913 or fax (301)31409290; e-mail dw34@umail.umd.edu.

January 9-11 – Winter & Spring, Educational Programs for the Green Industry. Eastern PA Turf Conference and Trade Show. Valley Forge Convention Center. Contains pesticide update credits. Contact: PA Turfgrass Council, (814)863-3475 or Michael Smith (610)828-0253. Penn State College of Agriculture Sciences: <http://www.cas.psu.edu>.

January 9, 10, 11 – 2001 Eastern Pennsylvania Turf Conference and Trade Show. Radisson Valley Forge Convention Center, 1160 First Ave., King of Prussia, PA 19406. Educational Program January 9, 10, 11/Trade Show - January 10 and 11. For more information contact: Nancy Bosold, phone (610)378-1327; or Michael Smith (610)828-0253-or PA Turfgrass Council (814)863-3475; sah15@psu.edu.

January 9-11 – MANTS, Mid-Atlantic Nurserymen’s Trade Show Inc. Baltimore Convention Center, Call (410)882-5300 or fax (410)882-0535.

January 16 – Winter & Spring, Educational Programs for the Green Industry. Eastern Regional Landscape-Nursery Seminar. Delaware Valley College. Contains pesticide update credits. Contact: Dave Suchanic (610)489-4315. Penn State College of Agriculture Sciences: <http://www.cas.psu.edu>

January 16-20 – Association of Professional Landscape Designers Winter Conference. Westward Look Resort, Tucson, AZ. Contact APLD, 710 E. Ogden Ave., Suite 600, Naperville IL 60563; tel: (630)579-3268; fax 630-369-2488; info@apl.org; www.apld.org

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

January 17 – 18 – Expressing Nature and Culture In the Designed Landscape. 11th Annual Symposium, New Directions in the American Landscape. For more information contact: (215)247-5777, ext. 156. Fee Per person: \$259 includes continental breakfast, lunch, breaks, and cocktail hour hors d’oeuvres. 8:30am – 4:30pm.

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

January 22-25 – Professional Horticulture Conference of Virginia, Ltd & Trade Show. Virginia Beach Pavilion & Double Tree Hotel. For information call: 757-523-4734, FAX 757-366-9604, PO Box 64446, Virginia Beach, VA 23467, www.phcv.org

January 23, 24, 30, 31 – Feb 1, 2, - Winter & Spring, Educational Programs for the Green Industry, Smedley Park. Deciduous Tree Identification. Contact: Rick Johnson (610)690-2655. Penn State College of Agriculture Sciences: <http://www.cas.psu.edu>

January 24 – Maryland Turfgrass Council, Turfgrass 2001 Conference and Trade Show. Maryland State Fairgrounds, Timonium, MD. Contact: John Krouse (301)345-4199.

January 25 – Northeastern Pa. Turf School and Trade Show. The Woodlands Inn and Resort, Wilkes-Barre, PA contact: Andrew McNitt (814)863-1368.

January 31 – Falcan Pesticide Recertification Conference.

Urbana Firehall, Urbana, MD. Contact: John Bradshaw (301)473-5678.

February 1-4 – ANLA 2001 Management Clinic, Louisville, KY. Contact: (202)789-2900, www.anla.org.

February 4-6 – Winter & Spring, Educational Programs for the Green Industry. Shade Tree Symposium and Trade Show. Lancaster Host Resort, Lancaster, PA. Contains pesticide update credits. Contact: PennDel ISA (215)795-0411, or Rick Johnson (610)690-2655. Penn State College of Agriculture Sciences: <http://www.cas.psu.edu>

February 6 – Central Maryland Pesticide Applicators for MD Recertification Conference. Timonium, MD. Contact Russell Balge (301)432-2767, ext 311.

February 6, 7, 8 – Winter & Spring, Educational Programs for the Green Industry. Pennsylvania Landscape and Nursery Conference. The Penn State, University Park. Contains pesticide update credits. Contact: Jim Sellmer (814)863-2250, or Dave Suchanic (610)489-4315. <http://www.cas.psu.edu/docs/CASCON/horted.reg.htm>

February 9 – Winter & Spring, Educational Programs for the Green Industry. KAFMO Conference. Holiday Inn, Grantville. Contains pesticide update credits. Contact Dan Douglas (610)375-8469, or Nancy Bosold (610)378-1327. <http://www.cas.psu.edu>

February 13 – Eastern Shore Pesticide Recertification Conference. Delmarva Convention Center, Salisbury, MD. Contact: Ginny Rosenkranz (410)749-6141.

February 15 – Winter & Spring, Educational Programs for the Green Industry. Winter Grounds Maintenance Seminar. Kutztown Grange. Contains pesticide update credits. Contact: Emelie Swackhamer (610)391-9840. <http://www.cas.psu.edu>

February 21 & 22 – Winter & Spring, Educational Programs for the Green Industry. Christmas Tree Short Course. State College. Contact: George Perry (570)622-4225. <http://www.cas.psu.edu>

February 21, 22, 23 – Winter Workshop, co-sponsored by Landscape Contractor Asso., and MD Coop. Extension. Contact: (301)948-0810.

February 21, 28 – Winter & Spring, Educational Programs for the Green Industry. Estimating & Bidding for Landscape Maintenance. Neshaminy Manor Center. Contact: Jim Sargent (215)345-3283. <http://www.cas.psu.edu>

February 22 – MGGA Winter Conference. Martin's Crosswinds, Greenbelt, MD. Contact: Hank Doong (301)249-1700.

February 27-28 – Western Pa. Turf Conference and Trade Show. Pittsburg Expo Mart/Radisson Hotel, Monroeville, PA Call: (814)863-3475.

March 4-11 – Winter & Spring, Educational Programs for the Green Industry. Philadelphia Flower Show. PA Convention Center. Contact: Pennsylvania Horticultural Society (215)988-8800

July 14-18 – Ohio Florists' Association Short Course. Greater Columbus Convention Center, Columbus OH. Contact: Ohio Florists' Assn., 2130 Stella Ct., Ste. 200, Columbus OH 43215-1033; tel: (614)487-1117; fax 614-487-1216; ofa@ofa.org; www.ofa.org

