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1993
June/July



The Plantsman

NEW HAMPSHIRE PLANT GROWERS ASSOCIATION

June & July 1993



*Summer Meeting
See page 14*

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June & July 1993



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C A L E N D A R

June

JUNE 16 NHPGA Twilight Meeting, 6 p.m., Michaud's Nurseries & Greenhouses, Exeter, NH; for information: (603) 772-3698.

JUNE 27 FTD District 1-C Annual Meeting, Lebanon, NH; for information: Ray Savage at (603) 352-1155.

July

JULY 14 Connecticut Nurserymen's Association Summer Meeting hosted by Baker Nursery Companies, Brass Rail, Lake Congamond, MA; for information: (203) 872-2095.

JULY 18-20 MANTS, Baltimore, MD; (301) 256-6474.

JULY 27-29 PANTS, King of Prussia, PA; (717) 238-1673.

August

AUGUST 3 Massachusetts Nurserymen's Association Summer Meeting (hosted by Laughton's Garden Center), Middlesex County 4-H Fairgrounds, Weston, MA; information: (508) 534-1775.

AUGUST 5-8 AAN Convention, Dallas, Texas; for information: (202) 789-2900.

AUGUST 12 New England Nurserymen's Summer Meeting (hosted by Winding Brook Turf Farm); Kennebunk, ME; information: (617) 431-1595.

AUGUST 13-15 Northeast Organic Farming Association (NOFA) 19th Annual Summer Conference & Celebration of Rural Life, Hampshire College, Amherst, MA; information: Amy Wales or Mark Allman at (617) 259-4443 or Julie Rawson or Jack Kittredge at (508) 355-2853.

AUGUST 18 New Hampshire Plant Growers' Association Summer Meeting, Elliott & Williams Roses, Dover, NH; for information: Bob Demers, Jr., at (603) 625-8298.

AUGUST 18-19 Pennsylvania Landscape and Nursery Trade Show & Conference, ExpoMart, Monroeville, PA; for information: (717) 238-1673.

AUGUST 19 Vermont Plantsmen's Association Summer Meeting, University of Vermont Horticulture Research Center, South Burlington, VT; for information: Scott Pfister at (802) 244-7048.

AUGUST 26 Eighth Biennial Griffin Greenhouse and Nursery Supplies Open House, Tewksbury, MA; for information: (508) 851-4346.

September

SEPTEMBER 17 New Hampshire Composting Conference, Center of New Hampshire Holiday Inn & Convention Center, Manchester, NH; for information: Nancy Adams at (603) 659-5616.

SEPTEMBER 22 NHPGA Twilight Meeting, 5:30 pm at Carpenter's Olde English Greenhouse & Florist, Newmarket, NH; for information: Rob Carpenter at (603) 659-3391.

SEPTEMBER 28-30 International Conference on Thysanoptera, University of Vermont, Burlington, VT; for information: Bruce Parker at (802) 658-4453.

October

OCTOBER 2-5 26th Annual Conference, Professional Plant Growers Association, Tampa Convention Center, Tampa, FL; 1-800-647-PPGA.

OCTOBER 20 NHPGA-sponsored Pesticide Applicator Recertification Program, place to be announced; for information: Chris Robarge at (603) 862-1074.

November

NOVEMBER 5-8 Association of Specialty Cut Flower Growers' Sixth National Conference, Doubletree Hotel, Overland Park, Kansas; for information: Alan Stevens at (913) 532-5173.

And Looking Ahead...

JANUARY 27-29, 1994 New England Grows, Hynes Convention Center, Boston, MA; for information: (617) 431-1622.

Cover

Aldrich Memorial and Garden, 1908.
Credit: Strawberry Banke Museum.

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The *Plantsman* is published in early February, April, June, August, October, and December with copy deadlines being the 5th of each prior month. While camera-ready ads are preferred, set-up assistance is available at a nominal fee. Free classified advertising is offered as a member service. We will carry a short message (no artwork or logos) for one or two issues of *The Plantsman*.

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For further information, please contact the editor: Robert Parker at the UNH Research Greenhouses, Durham, NH 03824, (603) 862-2061, or PO Box 5, Newfields, NH 03856, (603) 778-8353.



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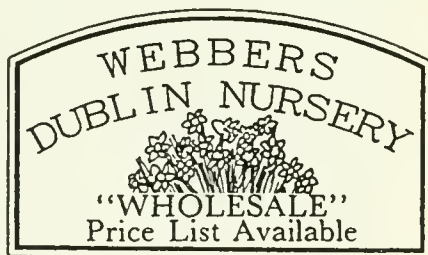


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**Twilight Meeting—
Kathan Gardens**

April 29 was one of those spring days in which you're so busy watering that you don't have time to think about just how perfect the day really is. But twenty people did think about it and took time to enjoy the hospitality of Dennis and Jill and Dennis's parents, Anne and Ollie, at a NHPGA twilight meeting at Kathan Gardens in Newport.

Dennis guided his guests through a series of meticulously kept greenhouses filled with spring plants and offered thoughts on running a successful wholesale/retail business and some of the methods he uses to accomplish this—hand seeding ("it's actually cheaper for us to hand seed, then transplant, than to buy in plugs"), loam ("real soil is essential to the health of the plant"), cold frames ("I'm not sure there's a better place to grow a pansy....") Dennis sees himself as a niche wholesaler—giving almost retail service to small businesses that need only small quantities of material.

And after the tour, there was conversation and plenty of refreshments. People lingered until eight.

The NHPGA thanks Dennis for his hospitality and his willingness to share with NHPGA members some of his time and ideas. It was a fine evening.

Newest Worker Protection Standards Take Effect April 21 for State's Agricultural Pesticide Users

(from *The Weekly Market Bulletin*, April, 1993)

*Murray L. McKay, Director
Division of Pesticide Control*

"As many in the agricultural community are aware, new worker protection standards have been implemented that will affect pesticide users in farms, forests, nurseries, and greenhouses, and April 21 is the date when agricultural pesticides bearing worker protection labeling may begin to show up in the marketplace. A lot of producers will be wondering just what they will have to do as of this date.

"It may turn out that many individuals will be using pesticides that are still labeled under the old standards, which may continue to be manufactured and distributed until April 1994. If so, simply follow all use instructions and precautionary statements on the labels of the products being used.

"If you happen to be using a product that has been labeled under the new standard, you will likewise have to follow the specific label instructions: the difference is that the precautionary statements and some of the use instructions, particularly regarding personal protective equipment, reentry restrictions, and worker notification requirements, will be more explicit. Reentry restrictions, for example, will be given in hours, rather than "until dust had settled or spray has dried." Protective clothing requirements will also be laid out in

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more specific terms.

"Keep in mind that protective clothing and personal protective equipment specified on pesticide labels are not optional, and failure to use such items in accordance with the label constitutes a misuse of pesticide.

"You will recognize products labeled under the new standard by the presence of a reference statement under the heading "Agricultural Use Requirements," which will state "Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170." You are only bound by the standard if this reference point is present.

"Most of the provisions of 40 CFR part 170, however, which involve requirements for training, decontamination, notification, and emergency assistance, will not be enforced until April 15, 1994, to give pesticide users time to become familiar with the standard. Certain provisions, however, such as those that allow for exceptions to some of the reentry restrictions for early-entry workers and during agricultural emergencies, will be in effect this April, along with the specific label instructions."

For more information, contact the Division of Pesticide Control at 603 272-2154.

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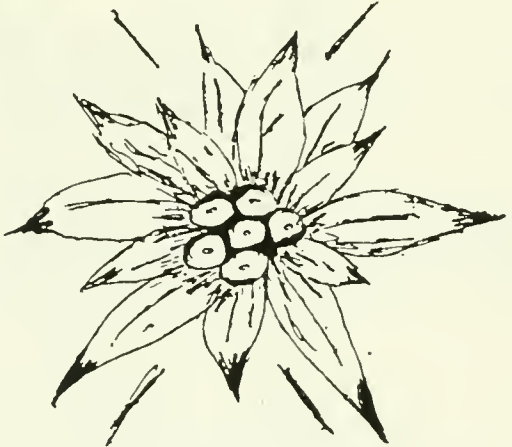
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Proposed Changes to the Pesticide Recertification Program

Dr. Stanley R. Swier
UNHCE Pesticide Education Coordinator

On April 6, 1993 the Pesticide Control Board met to discuss proposed changes to the Private/Commercial Applicator Recertification Program. The Pesticide Control Board approved the changes which will be in effect January 1994 if finally approved after going through the rulemaking process. Following is a summary of those proposed changes based on information provided by Murray McKay, Director, Pesticide Control Division.

APPLICATION FOR SEMINAR DEADLINE:

Current: 45 days

Proposed: 30 days

Advantages: The change will allow seminar sponsors more leeway in planning a meeting, particularly in the summer (i.e. Twilight meetings). It will also align NH more closely with other New England states, making it easier for other states to apply for NH credit.

APPLICATOR CERTIFICATES OF ATTENDANCE:

Current: Applicators must submit all certificates in December of their recertification year.

Proposed: Certificates will be submitted on an annual basis with appropriate renewal paperwork. Credits will be tracked by the state and appear on the following years documents.

Advantages: Having the state keep track of credits on an annual basis will save the applicator from the necessity of holding paperwork for five years. The applicator will be aware of exactly how many credits he or she needs. Also, if an applicator has been given a certificate that is not eligible for credit, he or she will be notified on a yearly basis, rather than finding out at the end of the 5 year period when it is too late to receive additional credit.

CORE & CATEGORY CREDITS:

Current: Applicators are required to receive 4 CORE credits and 8 category credits during a 5 year recertification period. Category credits must be in the area(s) in which the applicator received his or her permit. Example: a private applicator with a license in Vegetable (VG) must receive 4 CORE and 8 category credits in Vegetable (VG).

Proposed: Credits will no longer be CORE or category, but simply credits. Private applicators will be required to earn 15 credits. Example: a private applicator with a license in Vegetable (VG) must receive 15 credits overall, not limited to Vegetable (VG). Commercial applicators will be required to receive 12 credits per category. Example: if the commercial applicator is licensed in 3 areas he or she will need 36 credits, regardless of the subject matter.

Advantages: Private applicators who are involved in several commodities will be able to attend a variety of meetings increasing his or her knowledge and still receive necessary credits. Commercial applicators will have more flexibility in attending meetings in NH and other states as well as picking and choosing which meetings will be more advantageous to their job.

ADVERTISING MEETINGS IN THE WEEKLY MARKET BULLETIN:

Current: The Pesticide Control Division advertises all meetings receiving NH credit in the "Weekly Market Bulletin".

Proposed: The PCD will no longer advertise meetings in the "Weekly Market Bulletin". A list will be published on a monthly basis and applicators will need to contact the Pesticide Control Division and request an updated list. Updated lists will also be available at county Cooperative Extension offices.

Advantages: Applicators will not have to rely on the "Weekly Market Bulletin" for upcoming meeting information. They will be able to see exactly what meetings are being held and what credits are offered without having to search for it. Also, if there is any concern about whether or not a meeting is receiving NH credit, it will be easy to check, since only accredited meetings will appear on the list. Sponsors will still be able to use the "Weekly Market Bulletin" for announcements as they see fit.

All of us in Cooperative Extension feel that these changes will greatly improve the recertification program. We hope that you will support the Pesticide Control Division as it proceeds with the rule-making process.



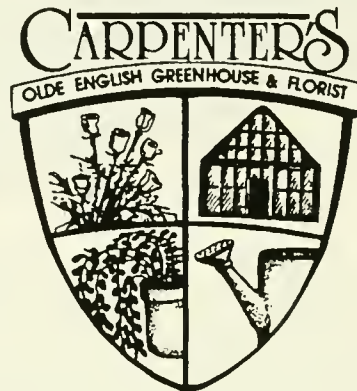
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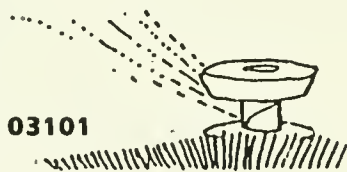
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News from the Legislature

NO. 119 UPDATE

House Bill No. 119-FN-Local, introduced by Rep. Marilyn Campbell (R-Salem), gives exclusive authority over the use, regulation, sale, or transportation of pesticides to the Division of Pesticide Control, Department of Agriculture.

The bill passed the house. A hearing scheduled before the Senate Environmental Committee on April 8 was so crowded that a second hearing was scheduled on April 29.

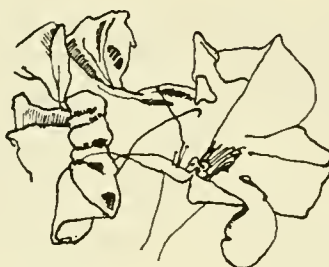
The bill has produced many strongly stated viewpoints, pitting the state, farmers, utilities, and chemical manufacturers against environmentalists and local control advocates. Sen. Richard Russman (R-Kingston), Chairman of the Senate Environment Committee, was quoted in *The Boston Globe* as saying, "so far, both sides are perhaps overstating the case." This may be so, but it is important to have made your viewpoints known.

...AND NO. 252.

House Bill No. 252-FN-LOCAL, which would allow the wetlands board to adopt rules to expedite the permitting process for minimum impact projects in forestry, agriculture and recreation and town road maintenance, was signed into law. It became effective June seventh. (An expedited permit would not be available for subdivisions, commercial development, or new road construction.)

CURRENT USE REIMBURSEMENT—NH SUPREME COURT REVIEW
(from *SPACE Newsletter*, Spring, 1993).

The NH House of Representatives Environment & Agriculture Committee has requested a review by the NH Supreme Court of House Bill 570, a bill establishing a current use municipal reimbursement fund



paid for by increasing the land use change tax. The justices will consider whether it is constitutional to increase the land use change tax (LUCT)—the penalty paid by current use landowners when they develop their land—without grandfathering all existing landowners enrolled in the program.

As introduced, the bill proposes to increase the LUCT up to 15%, with any increased revenue over the current 10% penalty being distributed back to municipalities on a per-acre basis. The intent is to reduce some of the "economic burden" imposed by current use on mostly smaller, rural communities. Committee Vice-Chair David Scanlan expects an opinion to be issued by the Court by summer and full consideration of the bill during the 1994 session.

(SPACE—Statewide Program of Action to Conserve our Environment—is at 54 Portsmouth Street in Concord. For more information on current use issues, call them at 603-224-3306.)

A Graduation

On Tuesday, May fourth, a cake covered with pink frosting roses and a tour of the UNH Research Greenhouses were just part of the graduation day activities for the 50 participants in a pilot Master Gardener Program offered by UNH Cooperative Extension. This program involved fifteen weeks of classes (45 hours of classroom instruction and optional hands-on training) at UNH Manchester.

After graduation, Master Gardeners are required to give 30 hours

of volunteer service, thus extending the information gained into their communities.

Dates for the next program have not yet been announced. To be on the list to receive this information, contact your county extension office.

Gypsy Moths—Big Time

(*The Boston Sunday Globe*, April 30.)

State Entomologist Siegfried Thewke says that last year was the second in a three-year cycle for the gypsy moths, which normally "build to a crescendo" in the third year before they die victims of parasites and viruses. "We do have a population of eggs out there and will have some defoliation in the same area as last year, between Interstate 93 and the coast."

The long-haired caterpillars with red and blue dots should be around until late July. Then there will be a three-week outbreak of moths.

There's nothing special about southeastern New Hampshire that makes the moths want to go there, he said. "It's just sheer luck, because the moths are wind-borne."

Show Time Roundup

THE SEACOAST FLOWER SHOW—LOOKING FORWARD TO NUMBER EIGHT.

The Seventh Annual Seacoast Area Flower & Garden Show (March 12-14) had a life filled with difficulties. It wasn't until January 15 that a location was found in the 'Old Channel Building' on Lafayette Road. But energy normally spent on other aspects was spent in the long and often frustrating search. Several times there was serious talk of cancellation.

A strong, well-publicized show opened on Friday, only to have a snowstorm arrive on the afternoon of the thirteenth. The snow was over by Sunday morning, but there was a lot of digging out to do and it was decided not to open on

Sunday.

The good aspects of all this is that the turnout during the days it was open was heavy and that the exhibits—particularly of the participating landscapers—were “the best yet.” There had been no wrap-up meeting as of the first of May, but plans are going ahead for next year. It will probably be held on the second weekend in March in 1994 and someone is already working on finding a location. If you know of one, contact Brenda Schure at (603)-436-0815.

NHLA'S LANDSCAPE EXPOSITION—“A GREAT WAY TO USHER IN THE 1993 SEASON.”
(from the *New Hampshire Landscape Association Newsletter*, April, 1993).

At the Third Annual New England landscape Exposition (March 15-16), “excellent, pertinent and meaty presentations filled each day; many of those attending felt it was the best organized and most rewarding Exposition yet.” Keynote speaker was James A. van Sweden, author of *Bold Romantic Gardens*. “Over the two days probably 225 people or more, including speakers and exhibitors, participated; a good turnout, but far from the potential attendance that New Hampshire's green industry could support.”

At the awards luncheon on the second day, NHLA Scholarships were presented to Heather Ashford (Pinkerton Academy) and Kenneth Michael (Pembroke Academy). Both will be attending UNH Thompson School this fall.

Eight Grand Awards were among the 18 Leon E. Pearson Awards for Landscape Excellence. These were given—in the Residential, \$75,000 and Over category—to Homestead Landscaping, Inc., for Roger's Terrace, The Rynearson Company for Residential Landscape and Pellettieri Associates, Inc., (two awards) for residences in Concord and Hampton. In the Maintenance (Over Two Years) category, New

England Landscaping, Inc., and Coronis Landscaping, Inc., were given awards for the Moskowitz estate and Anheuser-Busch, Inc., respectively. In the Single Aspect category, The Rynearson Company was given an award for a sunny perennial Garden and Hayden Hillsgrove Stone Masonry, an award for a Salem Witch Trials Tercentenary Memorial.

Congratulations to all.

NEW HAMPSHIRE ORCHID SOCIETY

In spite of a snowy Sunday morning, the New Hampshire Orchid Society (NHOS) Show in Manchester (March 19-21) was a success. There were fewer exhibitors—although both TeleFlora and FTD were exhibiting for the first time—and attendance was less than last year's, there were some real high points.

Governor Merrill attended the preview and proclaimed March 18-21 “New Hampshire Orchid Week.” He also presented the Governor's Trophy (for the best orchid plant grown by a NH Orchid Society Member in the orchid society's exhibit) to Angela Provost of Concord for SLC Mine Gold O.C., which also won a trophy for the best cattleya in the show.

Paul Sawyer of Grafton (founder of the NHOS) received a Highly Commended Certificate (HCC) from the American Orchid Society. “The brilliant green, red-lipped flowers on Cymbidium Valley Zenith “Thellie's Emerald” HCC/AOS measured six inches across!” One spike held 15 of these flowers. Sawyer's Exotic Greenhouse in Grafton is the only commercial orchid grower in New Hampshire.

In other society news, on April 18, the NH Orchid Society was one of the founding members of the New England Orchid Council (NEOC), an organization made up of the nine New England orchid societies.

This organization will help space

New England shows more evenly throughout the year. A New England supplemental judging center be also be set up by 1994. The Northeast Region—headquartered in the Bronx—covers parts of New York and all of New England, as well as Quebec and the maritime provinces. A “local” judging center will enable more New England growers the opportunity to submit plants for judging and enter the AOS judge training program. (Getting to New York City every month is a difficult venture for a lot of New Englanders.) NEOS also plans to coordinate regional sales, shows, lectures.

Although orchids may never supplant the lilac, it sounds as if a lot more of them will be blooming here in the future.

(NHOS meets on the second Saturday of each month at the Immanuel Lutheran Church in Manchester at 1:00 pm. Take the South Willow Street Exit from Rte. 101, go south past the Mall of NH to lights at Huse Road. Take a left and go approximately 1/4 mile. Take a left onto Weston Road and an immediate left into the church parking lot. New members are always welcome. For more information, call Joanna Eckstrom at 603-654-5070.)

GREENHOUSE OPEN HOUSE

Only somewhat hampered by bad weather, the 23rd Annual University of New Hampshire Greenhouse Open House (April 2-3) drew around 3000 people, according to Dr. George Estes, chairman of the event. (On Saturday, attendance was buoyed by people attending Small Pets Day nearby.) It followed the traditional pattern and once again, “provided an opportunity for people to get up to date with what is going on at the college.” The gardens and plant displays of the Thompson school students seemed especially appreciated and the lectures were well attended. ☺



Pages 20-31. . .
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Rhododendron Weston's Pink Diamond (1964)*

Rhododendron Molly Fordham (1966)*

Rhododendron Milestone (1972)*

Rhododendron April Snow (1978)*

Azalea Jane Abbott (1942)*

Azalea Vyking (1958)*

Azalea Pink and Sweet (1963)*

Azalea Parade (1963)*

Azalea Golden Showers (1963)*

Azalea Pink Clusters (1972)*

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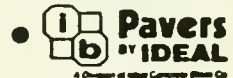
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A New Role for NENA

"A Clearing House of Information and Players"—that's what NENA hopes to become.

Pat Bigelow, Chairperson, and other members of the New England Nurserymen's Association (NENA) Legislative Affairs Committee are working to create a listing—changeable on an annual basis—of important legislative issues in each of the six New England states and also of the people involved.

This listing would be available upon request and should make it easier for people in the New England plant industry to follow bills relevant to the industry working their way through the various legislatures. And they would be able to make their views known to the right people because the key players are listed as well. As complicated and controversial bills appear more and more frequently,

the availability of this information could be very useful.

For more, contact Pat Bigelow at (508) 845-2143 or Virginia Wood at (617) 431-1595.

**RINA at URI—
Low Maintenance;
High Visibility**

Last year was the centennial for the University of Rhode Island. At the same time, a new Cooperative Extension Building was completed on campus. Like many building projects, there wasn't much set aside for landscaping.

One of the Rhode Island Nurserymen's Association (RINA) members, Judy Ireland, in conjunction with some others, presented a landscape plan to RINA and the Association "decided it was time to pay back URI for its many years of 'being there' when the nurserymen needed help."

Over 42 member firms donated the plant material; others contributed building materials, a water garden, a stone wall, etc. The total project will probably be a \$100,000 donation to the school from RINA.

The plant material being used is all low-maintenance, stress-tolerant material, installed under the supervision of Dr. Richard Cassagrande, coordinator of the LISA (Low Input Sustainable Agriculture) program at URI. When the project is finished (hopefully, this year), brochures discussing the plant material and where to obtain it will be made available to the public. "This is the one building on the campus where the homeowners goes with his problems, so our 'garden' will be highly visible."

Thanks go to Ken Lagerquist, RINA Secretary, for this item. For more information—and maybe a brochure about the RINA garden, contact Ken at 508-761-9260.

Daylight Savings Time Extension

(from AAN Update, April 30)

Legislation has been introduced in the House of Representatives to extend daylight savings time (DST) once again. Reps. Edward Markey (D-MA) and Carlos Moorehead (R-CA), the original sponsors of the successful legislation in 1986 that extended DST through the month of April, introduced H.R. 1553. This legislation would move the start of DST from the first Sunday in April to the third Sunday in March and extends it to the first Sunday in November.

Japanese Beetle Quarantine

(AAN Update, April 30)

The state of Utah has established a quarantine regulating the movement of nursery stock from Japanese beetle-infested areas into the state. All of New England and



TIPS

From the Griffin Guru

IS THE WORD "ORNAMENTAL" ON THE LABEL?

A letter from one of our horticultural chemical suppliers brought up the point of STEWARDSHIP (an individual's responsibility to manage property with the proper regard).


"Product Stewardship," as it relates to the survival of compounds labelled for use by the ornamentals grower, was a major concern. The letter went on to say that we, as an industry, must support those products LABELLED FOR ORNAMENTALS or in time those products will disappear from the marketplace. The letter states, "Growers who use non-registered products because they feel they're realizing a cost saving are setting themselves up for drastic consequences. They may win the battle, but I assure you that they will lose the war and ultimately lose registration of ornamental products. Dupont's recent move to pull their entire line could be just the tip of the iceberg if we don't all practice Product Stewardship."

To use another well-worn statement, it is vital to note that the use of a pesticide not specifically labelled for the treated crop is a violation of the law. This also leaves the grower without recourse to liability claims if a problem occurs with off-label use.

We think there is great merit in the chemical suppliers' request that we as distributors get the word out to our customers.

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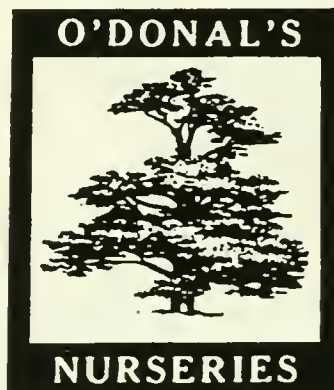
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Nurseries should verify all requirements before shipping to any states with Japanese beetle quarantines. For information, contact Craig Regelbrugge at AAN (202-789-2900) or your state nursery inspector (in New Hampshire, at 603-271-2561).

New Cultivars

from *Greenhouse Manager*, April 1993

A UNIQUE PEPPER

After ten years, plant pathologist Philip Dukes and plant geneticist Richard Fery of the USDA's Agricultural Research Service in Charleston, SC, have developed a cayenne pepper that changes color as it develops. 'Charleston Hot,' developed from 'Carolina Cayenne,' is compact, high-yielding, and resistant to nematodes.

'Charleston Hot' reaches 18 inches height at maturity. (Typically, cayenne pepper plants can grow up to three feet tall with a comparable spread.) As the peppers ripen, they change from yellow-green to golden yellow, bright or-

ange and deep red. The fruit is four inches long and quite pungent, registering about 70,000 to 100,000 Scoville heat units.

'Charleston Hot' is not commercially available, but breeders can obtain limited amounts of seed from the researchers. For more: Philip Dukes and Richard Fery, US Vegetable Laboratory, 2875 Savannah Highway, Charleston, SC; (803) 556-0840.

THREE DAFFODILS

Three daffodil cultivars are available from Dutch breeders: yellow-white 'Las Vegas,' white with orange 'Accent,' and double-flowered yellow 'Dick Wilden.' Contact Flower Council of Holland: (212) 307-1818. ☛



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1993 Summer Meeting



The 1993 Annual Summer Meeting of the New Hampshire Plant Growers' Association will be held at Elliott & Williams Roses on Dover Point Road in Dover, New Hampshire on Wednesday, August 18.



Craig Williams described some aspects of his family's operation:

"Elliott & Williams Roses is northern New England's largest cut flower operation, producing approximately 5 million cut roses, as well as cut lilies, snaps, and stephanotis.

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"In 1986, we built an additional 45,000 square feet of greenhouse, bringing the total growing area to 21,000 square feet. This new structure is an aluminum ridge and furrow with double layer acrylic covering. Most of the older structures have been retrofitted with acrylic coverings (House One was destroyed by fire, then rebuilt, in 1987.)

Environmental systems are controlled by computers which are even able to sense approaching storms, shutting off fans and evaporative cooling and lowering vents before the storm actually arrives. Cooling is controlled by indoor and outdoor temperatures and the time of day, as well as by heat gain from solar loads. Because of this, systems cycle down when light levels fall, even though set points may not have been reached. Heating systems also consider time of day and outside and indoor temperature, as well as solar gains, when determining operation. The computer also controls humidification, dehumidification, lighting, and carbon dioxide injection."

Hosts Craig and Barry Williams will talk about running an operation of this size and how they've kept it competitive in the international flower market.

In addition to the greenhouses and flower wholesale operations, Elliott & Williams operates approximately 40 acres of orchards. Apples, peaches, and blueberries will be available for pick-your-own during this day, so plan to bring some fresh fruit home.

The day includes tours, a morning speaker, lunch (another Perillo's extravaganza) and the auction in the afternoon. And a "bigger and better" trade show all day.

Because of the many attractions in the seacoast area and the fact that many members traveling from quite a distance may not get down this way too often, the meeting will end in mid-afternoon. Members will be given a list of some of the area's highlights—both gardening (Fuller Rose Garden, Strawberry Banke, Prescott Park, Odiome Point, the Moffatt-Ladd House, Hamilton House, etc.) and otherwise (the Children's Museum, seafood restaurants, the fireworks at Hampton Beach, etc.) with hours and fees, maybe a few discount coupons (the board is working on it), and a map showing how to get there. (A lot of the gardens are open until twilight.)

So it looks like a full and terrific day—lots of information with a mini-vacation at the end. Hope to see you there. ✨



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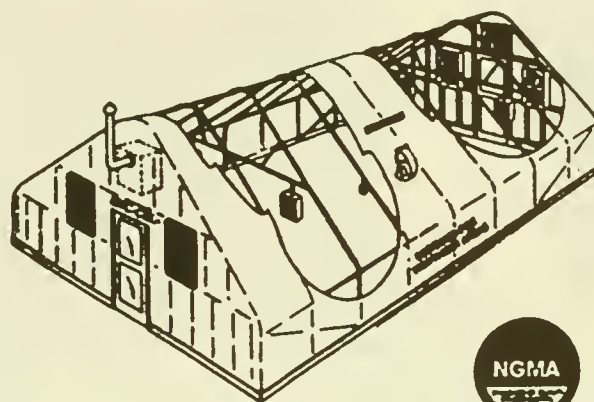
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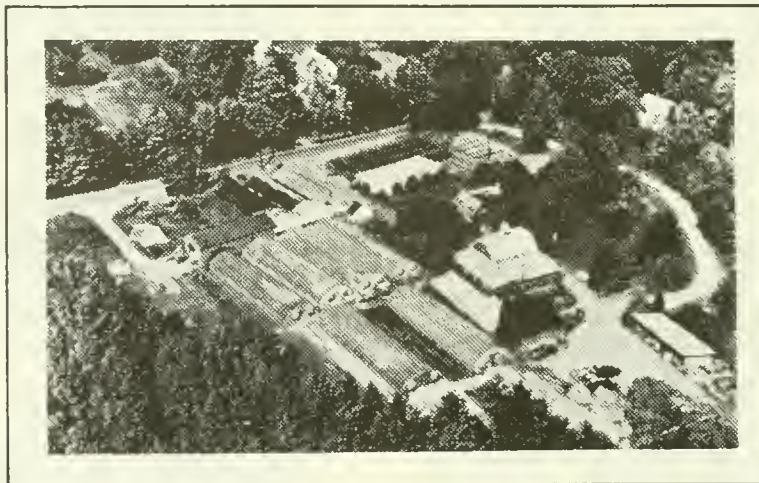
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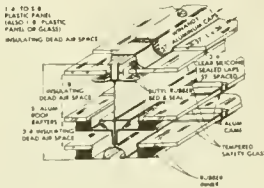
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Growing the Gardens at Strawberry Banke Museum

Ann Duncan

Strawberry Banke Museum, located on a ten-acre site in the South End of Portsmouth, New Hampshire, examines 350 years of changes in the Puddle Dock neighborhood: changes in architecture, material goods, economics, politics, demographics, and—for our purposes—landscape.

Gardens have been recreated at several of the restored houses, often using a combination of archeology, document and deed resources, family correspondence, and in some cases, photographs, garden plans, and even oral history sources. The challenge for the horticulture staff, then, is to grow plant material specific to the particular time period represented by the restoration.

One of the first gardens restored and the earliest represented is the 1720s garden of the Joseph Sherburne house. Based extensively on archeology, the garden is composed of fenced, symmetrically arranged raised beds and pea-stone gravel walks. Growing here are plants necessary to an early 18th-century household that had relatively limited markets from which to draw. The garden supplied not only fruits and vegetables, but also many of the medicinal needs of the family. Seed and pollen analysis of the 18th-century soil layers reveals evidence of both native and cultivated plants: oak, birch, juniper, pine, hemlock, rose,

dogwood, ragweed, bindweed, portulaca, dandelion, primrose, mustard, cucumber, sorrel, sunflower, raspberry, and a legume were all growing in—or in the vicinity of—the Sherburne garden.

Today's interest in heirloom seed varieties has made the horticulture staff's job of obtaining appropriate seeds for the Sherburne garden much easier. Some seeds and plants, such as sorrel, elecampagne, horseradish, and rue, have changed little since 1730. On the other hand, many of the vegetables growing at the Sherburne site are much different than their 20th-century descendants. You may see English Broad Bean, Scarlet Runner Bean, Long Orange Carrot, Premium Late Flat Dutch Cabbage, Pepper Grass, and Early Blood Turnip. An apothecary rose would be used for rose water and its hips as the source of vitamin C. The apples growing in the Sherburne orchard, planted last spring, are Roxbury Russets—a good cider apple.

A century later, in the 1830s, the widow Mary Ryder had a much larger number of sources (among them, the Canterbury Shakers) and a greater variety of seeds and plants from which to choose. The seed industry had expanded, making available prepackaged seeds. A survey of local newspapers indicates an active nursery and seed

trade in the Portsmouth area.

Mary's house and two outbuildings took up much of her small urban lot, but it is likely she grew at least some small fruit trees and bush fruits such as quince, currant, or gooseberry. Her probate inventory reveals she owned a wheelbarrow, watering can, and a lot of gardening tools. Perhaps she was gardening on an adjacent lot which she owned.

An interesting development occurred while researching the Ryder property restoration. A South End resident appeared one day with several seed packets he had discovered in the walls of his attic. He generously donated them to Strawberry Banke for investigation. Three of the packets had graphics on them, indicating they were from Boston seed houses: Joseph Breck and Ellis & Bosson. They were marked 'Portuguese Sweet Marjoram,' 'Long Blood Beet,' and 'Early Dutch Parsnip.' The other five packets were homemade pouches made of rag paper. Two contained beans, one of which was identified with the words, 'White Cranberry Beans' written in ink.

The museum's curatorial staff confirmed our estimate of the date of the packets, placing them c. 1830-1840 (based on the graphics). (Breck's Seed House was established in 1818 and Portsmouth newspaper advertisements mention the seed varieties noted.) The seed packets, then, were in use the same time Mary Ryder may have been planting her garden.

Still wanting to identify the second bean variety, our archaeologist, Martha Pinello, referred us to an ethnobotanist, Dr. Lawrence Kaplan of UMass Boston. He was able to verify 'White Cranberry' and to identify 'Refugee' as the second variety.

Searching seed catalogs, we were able to find all but the Refugee Beans. Shumway Seeds in South Carolina proved an invaluable source of many older varieties. Although Refugee remains elusive, Seed Savers Exchange in Iowa provided us with a near substitute: 'Lazy Wife' Bean.

By the 1860s, Sarah Parker Rice Goodwin had a well-developed garden which was laid out in the then-popular "Bedding Out" style. The garden was composed primarily of annuals such as Drummonds Phlox, Shirley poppies, tall snapdragons, French marigolds, salvia, petunias, balsam, lavatera, ambrosia...and countless others. Mrs. Goodwin left extensive diaries and these, along with a garden plan drawn by A.J. Hoyt in 1862, are the primary resources for the garden restoration.

The Goodwins had a wealth of seeds and plant material available to them. Searching local advertisements as well as contemporary seed and garden catalogs, we find that gardeners in the 1860's, 70's and 80's had enormous choice. Often, the more exotic the plant, the more desirable it became. This, of course, was the age of plant im-

portation as well as increased world travel. Native plants of the western US were also being introduced in the eastern nursery trades. Fortunately, many seed catalogs from this time survive so we know what was available to Mrs. Goodwin. Many seeds grown in Sarah Goodwin's garden are now again desirable (and obtainable) as our interest in the past has heightened the interest in these flowers that so intrigued gardeners over a hundred years ago.

The annual plant material for the Goodwin garden is grown in a small greenhouse on site. Each year in the middle of May, the staff holds a plant sale in which many of these Victorian annuals are featured.

The Thomas Bailey Aldrich Garden was created in 1908 as a memorial to the author and editor who spent part of his boyhood here in Portsmouth. The material in this garden was originally comprised of plants mentioned in his poetry, though early newspaper descriptions suggest deviations occurred almost immediately.

The plants are mostly old-fashioned and highly fragrant: Maiden's Blush Rose, lilies, mignonette, pinks, violets, sweet peas, iris, foxglove....

The garden is enclosed by a high fence and is enhanced by several arbors and garden seats. Just as in early garden photos, a hops vine grows luxuriantly over the large arbor attached to the house. A grove of mature hemlock trees stands at one end of the garden, creating shade for flower beds that were originally in full sun. Sometimes, when preserving a garden in its original state, compromise is necessary in order to allow for natural maturation processes.

This summer we will install a Victory garden on the hill behind Strawberry Banke's newest restoration, the 1940s Abbott Corner Grocery Store. The garden belonged to a neighbor, Mrs. Fecunils. Here she grew many of the vegetables—tomatoes, beans, beets—that we would normally associate with a Victory Garden, as well as the flowers and rose bushes that her children gave to her each year. We are searching Extension Service bulletins of the period for Victory Garden recommendations and, in addition, have discussed several of the nearby gardens with former residents and neighbors.

We hope you have the opportunity to visit Strawberry Banke this season. Please stop in and see us if you do. ♣

Ann Duncan is a member of the horticulture staff at Strawberry Banke Museum in Portsmouth, NH. Strawberry Banke is open 10-5 every day through October 31. Admission is \$10 for adults and \$7 for children from six through 17; children below six are free. For information, call 603-433-1100; Ann's number there is 603-433-1108.



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Using Parasites and Predators to Control Insects on Ornamentals

Patricia J. Vittum

Drawing: John Weaver

Many customers have become increasingly concerned about the use of pesticides in plant production. They are concerned about a variety of environmental issues (run-off of pesticides or fertilizer into surface water, leaching of materials into ground water, exposure of people and pets). As a result, some of these people are beginning to look for alternatives, including buying plants which have been grown without the use of pesticides. While this may appear to be a simple solution, at least in the eyes of the consumer, most growers do not feel they can maintain plant quality without the use of pesticides. But there are some alternatives which may enable a grower to reduce his/her dependence on traditional pesticides, particularly insecticides. In the past several years many university researchers have been investigating the use of parasites and predators to control pest insects.

PARASITES (or more accurately, parasitoids) are insects which parasitize other insects. An adult female parasite will lay an egg on or in the body of the target insect. The egg hatches into a maggot or similar immature stage, which burrows into the body of the target and feeds on the internal tissue. Normally, the parasite passes through several molts inside the body of the target before it emerges as an adult, ready to repeat the process. Each individual parasite accounts for the death of only one "victim", but usually the females lay lots of eggs, so the population of parasites can be very effective.

PREDATORS are insects or close relatives (for example, spiders and some mites) which can seek and destroy target insects. Some predatory insects have chewing mouthparts, while others have specially designed sucking mouthparts which suck out the internal tissues of the "victim". Each predator is mobile and will find several victims during its lifetime. In fact, some predators will account for the death of ten or more target insects per day.

Some parasites and predators can be pur-

chased for release in greenhouses or nursery settings. However, certain basic concepts need to be understood before a grower attempts to use parasites or predators to control pest insect populations. First of all, sometimes there is a "lag time" between the time a parasite or predator is released and when that agent begins to have a noticeable effect on the target population. Usually a release is made when there is a fairly large population of the pest. This population is probably thriving and it will take a while (perhaps as much as a couple weeks) before the predator or parasite can begin to "catch up" with the targets. Then there is a period when the parasite or predator has a strong impact on the targets, reducing the population quickly and substantially.

However, sometimes the beneficial insect is too successful and destroys virtually all of the pest insects. There is nothing left for the beneficial insects to feed on and they ultimately starve. Invariably, the pest insect finds its way back into the greenhouse and re-establishes. As a result, follow up releases are usually necessary in response to each build up of the pest population. This, of course, is no different than using standard insecticides, in that repeat applications are usually necessary there as well.

Second, most beneficial insects and mites are sensitive to the traditional insecticides and miticides which are used in greenhouses and nurseries. If a grower uses a parasite to control a whitefly population and then a thrips population builds up, the grower may use a standard insecticide to control the thrips. Unfortunately, most of the parasites will also be killed by such an application. So balancing the use of parasites and predators in a full scale greenhouse or nursery operation can be very challenging. There are ways to coordinate efforts (for example, timing applications when parasites or predators are not present or are in less susceptible stages) to give the beneficial insects the best chance of survival.

Third, most beneficial insects have particular

stages during which they are most effective—and often they will attack certain stages of the pest more readily or more efficiently than other stages. For example, the *Encarsia* wasp which attacks greenhouse whiteflies attacks the third and fourth nymphal stages more readily than other stages. It also survives much more successfully when it attacks these larger stages. Most beneficial insects also have certain temperatures at which they are more effective. Some of these insects prefer warmer temperatures while others prefer cooler temperatures. It is critical to be aware of the preferences of the parasite or predator, so that you can time releases so they have the greatest chance of success.

One of the keys to success in a biological control program is to understand the life cycles of the pest and the beneficial insect. If a grower releases *Encarsia* wasps when most of the whitefly population is in the adult stage, the wasps probably will not have much success, because there will not be enough large nymphs to feed on. (Note that the wasps are usually released in their pupal stage, so it takes a little while for them to mature to adults and search for whiteflies. All of this must be taken into account when timing releases.)

Perhaps the most important key to successful use of parasites and predators is careful monitoring of the crop throughout the process. Pest insects must be identified early enough to enable a grower to order and receive the appropriate beneficial insect. Monitoring includes obtaining some sort of "count" of the number of insects present, but it is at least as important to know what percentage of the population is in each stage of development. This enables a grower to time the release of the beneficials when the target insects are in the most susceptible stage.

There are several examples of parasites and predators which are being used in commercial settings in the United States, Canada, and Europe. In some cases, parasites or predators are used during stock plant production and early plant development and then traditional insecticides are used for the latter stages of crop development. In such a setting, the number of insecticide applications can be reduced substantially. Some establishments have made a commitment to using beneficial insects and some of the "softer" insecticides, such as insect growth regulators, soaps, and oils exclusively.

Growers may already be familiar with some of the parasites and predators which are currently available commercially. *Encarsia formosa* is a parasitic wasp which attacks greenhouse whiteflies, preferably in the third and fourth nymphal stages. It can be quite effective, particularly at warmer temperatures (70-75 F) when used regularly, but the wasp is quite sensitive to many of the insecti-

cides used in greenhouses. This species of wasp does not appear to be nearly as effective against the sweet potato whitefly (or whatever it is being called this month!), in part because that whitefly is smaller and does not provide an adequate food supply.

Phytoseiulus persimilis is a predatory mite which attacks spider mites. The predator is very efficient and hunts down all stages of spider mites, from eggs to adults. In fact, these predators are often so efficient that they will eliminate a spider mite population and then starve to death. They are very mobile and can be seen moving on the surface of the plant, but they do not attack plants or animals.

Amblysius cucumeris is another predatory mite which is being used against various species of thrips. It is another very mobile species and is quite efficient. The "mealybug destroyer" (*Cryptolaemus* sp.) is a predatory beetle which seeks and destroys mealybugs. This predator has become a popular option in interior plantscape settings, but some customers have complained because they have seen the predatory beetle larvae on the foliage and thought they were mealybugs.

Currently research is being conducted at several universities and in commercial settings. New predators and parasites are being tested in controlled conditions. Several predators and parasites have shown promise against leafminers, whiteflies, spider mites, and thrips. Even more research is being conducted in the nursery and ornamentals setting. For example, a couple parasites have been released in Massachusetts to control euonymus scale. These parasites have survived the New England winters and there appears to be a strong possibility that these parasites will establish successfully in the Northeast.

Growers who wish to incorporate the use of parasites and predators into their operations should:

1. START SMALL.

Experiment with one range before trying to convert the entire operation. Learn how to release the insects. In some cases they are attached to a card which is then clipped onto the foliage, while in some cases they are in a small vial and the grower shakes the insects onto the plants.

2. FIND A REPUTABLE SUPPLIER.

Many firms are providing beneficial insects now. In most cases they serve as a "middleman" and obtain the insects from commercial insectaries. Find a firm which has a commitment to quality control and which can fill orders on short notice.

3. LEARN ABOUT THE LIFE CYCLES OF THE PEST AND THE BENEFICIAL.

Know what is the most susceptible stage of the pest. Know what the preferred temperatures are for the beneficials. Become familiar with the limitations—how large a target population can the predator or parasite handle?

4. FIND OUT WHICH INSECTICIDES OR MITICIDES SHOULD BE AVOIDED.

As a general rule, most of the standard insecticides will be detrimental to predatory insects and parasites, and most of the standard miticides will be detrimental to predatory mites. Sometimes soaps or oils can be used in conjunction with the beneficials, but the timing of application is critical.

5. HAVE REASONABLE EXPECTATIONS.

Parasites and predators work differently than do standard insecticides. They will not necessarily effect the pest population shortly after release. In some cases you may not be able to wait. In such instances, biological control may not be appropriate. However, in parts of the cropping system you

do have time - and should consider incorporating beneficial insects into your control program.

One of the challenges for growers in the north-eastern United States is that many of our ranges contain many different crops in varying stages of development. At the same time, there are often many different kinds of insect pests present, each of which might require a different kind of parasite or predator.

Biological control with parasites and predators can work in some conditions. It will not be right for everyone, but those who become proficient at using parasites and predators will have an edge in the market because they will have reduced their dependence on insecticides.

Dr. Patricia J. Vittum is Associate Professor in the Department of Entomology, Fernald Hall, UMass, Amherst, MA 01003. Her phone number is (413) 545-0268.

Drawing of Chilocorus kuwanae by Dr. John Weaver.

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Bay Farm North Hill

TWO OPPOSITES MAKE A GOOD BALANCE

Twelve years ago, Don Mitchell ("Mitch") moved up from Beverly, Massachusetts, to Newington, New Hampshire, and began Bay Farm Nursery, a wholesale operation.

Last year, Mitch and his partner, Pat Parent, opened a retail outlet called North Hill on Route 1 in North Hampton.

The two enterprises are very different in feeling, but each compliments and strengthens the other.



Bay Farm Nursery.

In the 1950s, Newington Road had become dead end, stopping at the edge of the newly-constructed Pease Air Force Base. It's still quiet and at Bay Farm, with its yellow-clapboard cape (with its decorative pool and exotic plantings) connected by an ell to the large barn behind it, there is no sound. The air from the bay is cool; the rows of evergreens become lines of simple geometric shapes in the strong April sun. A cat rubs against your leg. It's a nice place to concentrate on growing.

Which is what Mitch and Pat do. They grow and wholesale plant material—evergreens, a lot of perennials. Some are field-grown; most are containerized. They raise all sizes—"everything from one pint to two gallon."

There are also three greenhouses, totalling 6000 square feet. One is heated and used year-round; the others are used more as cold frames for newly potted plants in the spring.

In early fall, flats of herbs and perennials are seeded—herbs, perennials—then transplanted into deep 606 flats (2 1/2 square

by 4" deep, 36 per flat) and grown over the winter. This fall crop is a nicely-sized plant when it's time for spring sales.

Around March first, they seed another crop, following the same procedure, and puts this into the unheated houses. Once they're established, they go outside. What doesn't sell is put into the ground and overwintered. The next year, they're transplanted into one-gallon containers.

The largest perennials Mitch sells have been in the field for three years—if they haven't sold by then, they're gotten rid of.

"We're trying to use more biodegradable pots. Next year, everything we raise will be in biodegradable pots."

Everything is grown in either Metromix or their own combination of sand, decayed bark, and peat moss. Slow-release fertilizer is added. "We don't use loam—we don't sterilize and there's too much weed seed."

The market decides the crop. Right now, perennials are still big, but "instant results" seems to be something that customers are willing to pay for. This year, Mitch is growing 500 tomatoes in two-gallon containers ("If they have little tomatoes on them, they sell. People want to be the first on the block.") He's also growing annuals (cleome, zinnias) in five-gallon hexagonal containers—for instant color on a patio or deck. He's growing 1000 of

them and potential sales look good.

His hanging baskets reflect the same market trends. His ivy geraniums—grown in 14" baskets of sphagnum moss—give customers the color they want from the moment of purchase.

They do buy in material. Clematis seems to be something people want right now ('Nelly Moser' is their best-seller). This year Mitch is buying in 1500 clematis to pot up and grow for next year's sale. Again, the price will be higher, but a two-year plant will give that "instant color."

Cold-susceptible material is overwintered on shelves in the cellar under the barn. A 30x50 insulated, dirt-floored storage space equipped with fans—it never goes below freezing. This year, Mitch hopes to add a polytube vent to improve air circulation.

Outside, along with the unusual plantings around the house (Mitch's personal collection), there's also a small garden of specimen plants—and a collection of hemlocks. Hemlocks is one of Mitch's interests—he has a good selection—*Armstrong*, *Baldwin's Dwarf*, *Bennett*, *Cole's Prostrate*, *Curly*.... "The average homeowner doesn't know much about using them," Mitch says, and he tries to share his enthusiasm by incorporating hemlocks into his designs whenever it

seems appropriate. ("They're touchy about it being quite damp.")

Things grow well, but "by the bay, it's pretty windy" and Mitch and Pat rent a five-acre site off Hobbs Road in North Hampton where they grow taller trees and shrubs. It has good soil and a gently sloping southern exposure. A barn is on this property as well, so he can store equipment.

They sell to "customers we've had now a few years;" a salesman has given a list of the inventory and sells on a free-lance basis. Now, of course, they sell at North Hill.



North Hill.

North Hill is as public as Bay View is private. The traffic's heavy on Route One in North Hampton and there's plenty of other businesses around—Dexter Shoe, NE Log Homes, Robinson Construction...it's a good spot for a retail garden center—and North Hill is already into its second successful year.

North Hill isn't complicated. A chain link fence surrounds approximately one acre of sales area. A small grey clapboard structure with crisp white trim serves as the only entrance and checkout point. In the sales area there's also a 150x32 Atlas greenhouse which is used to hold hanging baskets and other flowering material.

"We didn't want a lot of overhead until we could see how it would work out," Mitch says. "We started with just one greenhouse—we realize we didn't have enough space—next year we'll put up another."

It's self-service—customers are given small wagons and wait on themselves—but Pat and the two

other women who work there full-time are there to answer questions too.

North Hill doesn't have everything yet—they sell peat moss and bark mulch, but no insecticides—"not for a year or two."

It's open from April until Christmas; although it's connected with Bay View, it's operated as a separate business. Pat is the manager. Between the two places, six full-time people are hired during the summer. "It works out well, because the crew can work at whichever place needs them most."

Annuals are shipped in, as are a lot of hangers and all the geraniums. About 50% of the material sold here is grown at Bay View. Mitch tries to buy in from local growers: "New Hampshire growers do real well in annuals and greenhouse plants, but we go everywhere for our nursery stock."

There's not much insect problem at North Hill. He releases ladybugs and lace wings in the spring and "they seem to take care of about everything."

He advertises heavily in local papers and on the radio, has a mailing list. Mitch thinks the mailings work best, but "you have to have something to offer."

Along with all this, Mitch landscapes in summer; Abercrombie and Finch, a restaurant across the road from North Hill, is an example of his work. His work there included the lighting and the walks, but he's more into plant material and, now—water gardens.

Water Gardening.

This year North Hill will stock a full line of water gardening supplies. "I like it," Mitch says. "I built the pool over at Bay Farm five years ago. I think other people will like it too." the pool at the house is amoeba-shaped with an edge of blue tiles...13x4, about two feet deep, and filled

with lilies and koi fish. "One of the fish learned to come up and ate out of our fingers. He got to be a pet. He also got to be about two feet long, so we had to get rid of him." Mitch designed and built the pool himself and says it's not hard to maintain, once you filter and neutralize the water.

They'll also stock a variety of pools—hard liner, soft liner—30 different shapes in all.

A small display pool with a waterfall is being constructed at North Hill this spring. Another display will consist of twenty or so whiskey barrels placed so that water will flow from one to another. A different type of water lily will grow each.

There will be pumps and filters—whatever's needed—for sale. A range of statuary, fountains, and birdbaths is there as well.

What's most interesting is that Mitch and Pat are building a new pool at Bay Farm—100x14, 18" deep, filtered and with the necessary water circulation—specifically for growing water plants. Open in the summer, it will be covered with a greenhouse-like structure in winter to allow year-round production.

They plan to have about 1000 different types—water lilies, irises—in stock at North Hill. A lot of them they will have grown themselves.

Mitch sees water gardening as something that would interest his customers and he's building his niche early in what could be a developing trend. With Mitch growing a lot of his own stock, it would be sensible for a beginner to go to a place like North Hill where practical experience could answer a lot of questions.

For more information, call Mitch or Pat at Bay Farm Nursery, 400 Newington Road, Newington, NH 03801 (603-436-6620) or North Hill Nursery Outlet, 206 Lafayette Road, North Hampton, NH 03862 (603-964-7104). (BP) 🌿

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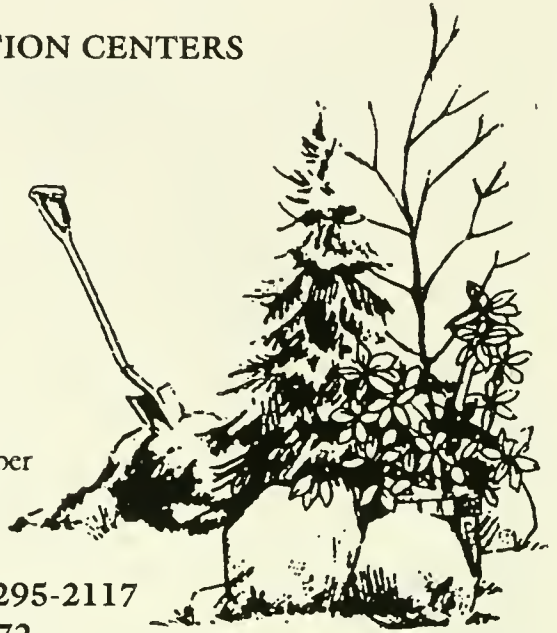
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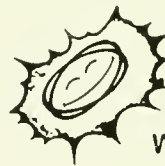
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Calibrating Low Pressure Boom Sprayers

George W. Hamilton

The effectiveness of any pesticide depends on proper application of the chemical. Proper calibration of sprayers measures how much material will be applied by the equipment under controlled conditions. Calibration of spray equipment results in the correct amount of pesticide material being applied to a given area and provides the applicator with the confidence of a job done right.

Low pressure boom sprayers are the most common pesticide sprayer. Proper calibration of these sprayers is critical to insure uniform application and economical pest control without overdosing and/or underdosing parts of the treated area. Operators must be familiar with the operation of the machinery they are using and follow the manufacturer's directions carefully.

Dr. James Mitchell, UNH Extension Specialist Agronomy, has developed a fact sheet titled, "Low Pressure Boom Sprayers—Calibration and Care." The fact sheet lists the method and steps in calibrating the boom sprayer. This fact sheet can be requested by contacting Dr. James Mitchell, Extension Specialist—Agronomy, UNH Cooperative Extension, Nesmith Hall, 131 Main Street, Durham, NH 03824-3597.

The following is a summary of this calibration method:

CALIBRATION METHOD

STEP 1. CHECK GENERAL SPRAYER OPERATION.

Fill the tank with water and operate the pump. Check for leaks, condition of hoses, proper operation of the pressure gauge and clogged nozzles.

Place a container under each nozzle and collect water sprayed from each nozzle for the same given time. If the output varies much, check to see whether any nozzles are clogged and whether all nozzles are the same size. Nozzles that have a flow rate greater or less than 10 percent of the average should be replaced. Nozzle wear depends on amount of use, nozzle material and type of pesticide or pesticide formulation used.

STEP 2. CHECK TRAVEL SPEED.

To measure ground speed, lay out a distance in the field to be sprayed. A distance of 88 feet is adequate for speeds under 2 mph and 176 feet for speeds between 2 and 4 mph. Select a gear and throttle setting that will be used when spraying—be sure to have the sprayer half to three quarters loaded when timing. Measure the time needed to travel the given distance in each direction and then average the time in seconds. To determine the travel speed, use the following formula:

$$\text{SPEED (MPH)} = \frac{\text{DISTANCE in FEET} \times 60 \text{ SECONDS}}{\text{AVERAGE TIME in SECONDS} \times 88 \text{ FEET}}$$

STEP 3. MEASURE NOZZLE OUTPUT.

1. Collect spray from all the tips on the boom for one minute while operating the sprayer in place at a desired operating pressure.
2. Compare the amount of water sprayed collected, in ounces, from each tip on the boom. Remember that any tip that delivers 10 percent more or less than the average should be cleaned or replaced and then repeat the collection for one minute.
3. Convert the average collections per tip from ounces per minute (GPM).

$$\text{GALLON per MINUTE (GPM)} = \frac{\text{OUNCES per MINUTE (OPM)}}{128 \text{ (OUNCES per GALLON)}}$$

4. Calculate the delivery of the sprayer to gallons per acre (GPA)

$$\text{GALLON PER ACRE (GPA)} = \frac{\text{GPM} \times 5940}{\text{MPH} \times \text{NOZZLE SPACING in inches}}$$

A CALIBRATION EXAMPLE

STEP 1. All nozzles were within the 10 percent tolerance level of the average output.

STEP 2. The boom sprayer traveled 176 feet in 46 seconds in the first pass and 50 seconds in the return pass.

$$\text{SPEED (MPH)} = \frac{\text{DISTANCE in FEET} \times 60 \text{ SECONDS}}{\text{AVERAGE TIME in SECONDS} \times 88 \text{ FEET}}$$

$$\text{MPH} = \frac{176 \times 60}{48 \times 88} = \frac{10560}{4224} = 2.5 \text{ MPH}$$

STEP 3A. The nozzle tips average 52 ounces per minute (OPM) at a selected pressure of 40 psi.

$$\text{GALLON PER MINUTE (GPM)} = \frac{\text{OUNCES per MINUTE (OPM)}}{128 \text{ OUNCES per GALLON}}$$

$$\text{GPM} = \frac{52}{128} = .406 \text{ GPM}$$

STEP 3B. Calculate the delivery of the sprayer to gallons per acre (GPA) if the nozzle spacing on the boom is 24 inches (effective spray pattern for each tip).

$$\text{GALLON PER ACRE (GPA)} = \frac{\text{GPM} \times 5940}{\text{MPH} \times \text{NOZZLE SPACING in inches}}$$

$$\text{GPA} = \frac{.06 \times 5940}{2.5 \times 24} = \frac{2412}{60} = 40.2 \text{ GPA}$$

THE RESULT: The sprayer output is 40.2 gallons of water is necessary to cover one acre.

Mix the recommended rate per acre of pesticide product to 40.2 gallons of water for each acre to be treated.

IN SUMMARY

Calibrating the sprayer is the first step in controlling pesticide application. With proper and accurate sprayer calibration, the operator will apply the appropriate amount of pesticide to control the pest(s) without damaging the target plant, animal, or surface, and will maximize the return on the pesticide investment.

To do an effective, safe and efficient application, the equipment must be properly adjusted, calibrated, operated and maintained. Read pesticide labels and follow all directions in order to obtain the desired control without harming the environment.

George W. Hamilton is an Extension Educator, Agricultural Resources, UNH Cooperative Extension, in Hillsborough County. His address there is 468 State Route 13 South, Milford, NH 03055; he can be reached at 603-673-2510.

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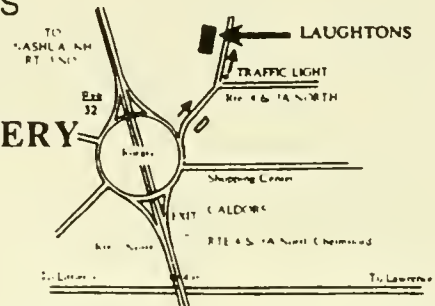
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AN ISLAND GARDEN *Restored*

Virginia Chisholm

Drawing Bob Parker

Perhaps one of the smallest and loveliest of New England gardens was begun over a hundred years ago by Celia Loughton Thaxter (1835-1894) on Appledore Island, one of the group of nine islands six miles off the Maine and New Hampshire coast that make up the Isles of Shoals.

Celia Loughton grew up on Appledore where her father, Thomas Loughton, built Appledore House, the first of the huge resort hotels that would line the east coast. When she was 16, she was married to Levi Thaxter, the son of a Boston banker. They lived outside Boston. The marriage was not successful and ended when Levi moved south for health reasons, taking with him their two younger sons. Celia returned to Appledore with Karl, their eldest son, to live with her ailing mother in her mother's cottage. Eventually she inherited this cottage.

She was already a well-known poet, but the return to Appledore marked the beginning of the most productive time of her life. A number of distinguished literary figures visited her during the summers and her cottage and its garden became well-known.

In the last years of her life, encouraged by Sarah Orne Jewett, Celia wrote *An Island Garden*, a charming book illustrated by Childe Hassam. To those who wish to restore or recreate a garden of this pe-

riod, this book is a treasure.

The book takes you through a gardening year in the small (15x50) garden surrounded by a gray wooden fence to protect it from the wind. A narrow continuous bed ran along the inside of the fence and nine small raised beds made up the center section. The book includes a diagram and planting scheme, but after reading the book, you realize she didn't always stick to the same plan. She liked to start her own seeds, so the garden is mostly annuals. She planted her seeds early in flats kept in south-facing windows. Difficult varieties were started in egg shells.

There are pages of descriptions of the flowers she grew as well as of island wildflowers. Most of the flowers are listed only by their common names—"candytuft, cleome, coreopsis, cosmos..." Shirley poppies were her favorites and she planted them in succession so they could be enjoyed all summer.

She had just a few perennials: a red peony, white phlox, a few roses, (*rugosa, polyantha*, Damask Jaquemont), day lilies, delphinium.

A variety of vines—Japanese hops, wisteria, nasturtium, clematis, honeysuckle, akebia, morning glory—were trained to climb up and over the porch in order to give badly needed shade.

The same Japanese hops that were used to make beer for the hotel still twine over the back fence of the garden.

Celia rose at four to work in her garden. This must have been the only time she could be by herself and enjoy the early morning and the flowers she loved so much.

She died in 1894, soon after *An Island Garden* was published, and was buried on Appledore. The Appledore House burned in 1914; Celia's cottage was destroyed in the blaze.

Appledore remained deserted until the 1970s, when the Shoals Marine Laboratory, a summer school of marine biology originally run jointly by Cornell University and the University of New Hampshire, was begun by Dr. John Kingsbury. Kingsbury reestablished Thaxter's garden on its original site in front of the foundation of her cottage. Since his retirement, Virginia Chisholm, with the help of the Rye Garden Club, maintains the garden. The flowers are grown in the Thompson School greenhouses at the University of New Hampshire and are brought to the island to be planted at the end of May.

At first it was difficult to find the seeds of some of the old-fashioned flowers that had not been dwarfed, doubled, or so developed that they had lost their scent. Now, with the great interest in restoring old gardens, old seed varieties are reappearing—although we still cannot find 'tall' single dahlias and some of Thaxter's roses.

The garden is planted according to Thaxter's plan.

but as summer goes on, plants are supplemented with those she writes about, but does not include on the diagram. It may seem surprising, but flowers go out of style just like clothing. Visitors to the garden are surprised by the number of blooms they have never seen before: helianthus, *phlox drummondii*, calliopsis, lavateria, venidium, *hesperis viscaria*—none are common today.

Thaxter planted many white flowers in the garden because she felt they looked lovely by moonlight. She had a tall white opium poppy she called "the Bride," as well as white petunias, phlox, and mignonette. Another white plant was the clematis 'Traveler's Joy,' which is like the *paniculata* that blooms in September. The clematis is no longer in the garden, but has been seeded over the island by birds. Its fragrance led us to it, but we haven't been successful in reintroducing it to the garden because most of it grows in the most enormous patch of poison ivy you could imagine.

Thaxter had no problem with water because there was a large reservoir as well as rain water collected from the roofs—and there were no gulls polluting the water either. Now, in order to take less water from the one well on the island, we use a low sprinkler system with a timer on the center beds.

We have been improving the soil over the years in the same way that Thaxter did—with seaweed, manure, and compost that we ask visitors to bring when they come to the garden. We also

keep two compost piles at the corners of the cottage foundation.

Our greatest problem (other than the gulls pulling out every white flower) are muskrats. The muskrats are true pests and last year broke into the garden many times before we could install stronger wire around the bottom of the fence. Naturally, the more special the plant, the faster the muskrats ate it.

The interest in the garden is amazing. People come by ferry, by cruise ships, and on their own boats. The garden is open on Wednesdays from July through Labor Day and reservations can be made by calling the Shoals Marine Laboratory at Cornell (607-254-2900). The Isles of Shoals Steamship Company on Market Street in Portsmouth runs a ferry to Star Island (leaving Portsmouth at 7:30; the return trip leaves Star Island at noon) and from there, the Shoals Marine Lab boat will take you across Gosport Harbor to Appledore. The round trip on the ferry is \$16.00; the trip to Appledore, \$25.00. It makes an interesting day trip.

Childe Hassam's illustrations to Thaxter's book might lead you to expect a restored English estate garden, but it is small—charming—a cutting garden—with the brilliant colors that so often occur along the coast.

Virginia Chisholm is an avid gardener and works on several of the historic gardens in the seacoast region. She lives in Rye and is a member of the Rye Garden Club. ♫

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Dear Members and Associates,

Pesticides are nothing to fool around with. The out-of-sight, out-of-mind attitude won't work twenty years from now when your body starts showing problems. Today's chemicals are as toxic as they ever were—the only differences are that safety information is now printed on the label and company representatives are doing a great job in safety education.

The reason I'm writing this article is that in college, people told us it was a good idea to have our cholinesterase monitored. When it came time for our annual physical, my Dad was first and I told him to have it checked. His doctor sent a blood sample to a local hospital for a check on his cholinesterase level. A short time later, he received a printout and a bill for nearly \$800.00. No one at the hospital understood what he needed and they checked every little thing in his blood.

This was a good lesson learned, so I thought I would pass it on to you.

What you should do is, during the off-season, make an appointment with your physician. Tell him you work with chemicals and that you'd like to have the test done. This off-season test will give you your blood base-line. Then, during the season you spray the most, have your blood checked a couple times again. This will tell you if the level has increased and whether or not you should stop spraying awhile to bring it back down to where it should be.

The price? This procedure costs approximately \$100. Below are a couple of good, reliable companies that do the procedure and who seemed very nice on the phone when I talked to them. Call for prices first—they vary according to your location. The labs are:

Roche Biomedical Laboratory, located throughout New England; phone: 1-800-828-6303.

Division of Chemlawn; write to: Manager, Clinical Laboratory, 135 Winter Road, Delaware, Ohio 43015; phone: (614) 548-7330.

If you want a tip from me, the only thing I have to say is—**DON'T DRINK THE WATER!**

Robert E. Demers, Jr., President, NHPGA
Demers Garden Center, Inc.

Test For Cholinesterase

A two-step method to test workers' cholinesterase levels can show if you're using proper insecticide handling procedures.

The EPA is expected to release an update soon of worker safety procedures designed specifically for farm workers. One of the provisions anticipated to be in the final draft involves examining cholinesterase levels in individuals who have contact with organophosphate and carbamate insecticides. Cholinesterase is essential for the proper functioning of nerves and muscle.

"This vital enzyme prevents the accumulation of an excess of acetylcholine, the chemical responsible for transmitting electrical impulses between nerves as well as between nerves, muscles, and secretory organs," says Dr. Roger A. Yeary, vice

president of Health, Safety, and Environmental Affairs for ChemLawn Services Corp., the lawn care company headquartered in Columbus, OH.

Overexposure to organophosphate and carbamate insecticides is known to lower cholinesterase in the nervous system, preventing the enzyme from controlling the amount of acetylcholine. "Therefore, decreasing levels of cholinesterase may induce symptoms such as fatigue, headache, blurred vision, nausea, vomiting, diarrhea, chest pains, difficulty in breathing, and excessive salivation and perspiration. An abundance of acetylcholine overactivates the nerves and muscles which control the gastrointestinal tract, often resulting in flu-like symptoms of vomiting and diarrhea.

"It's also important to recognize the cumulative effect of insecticides

resulting from uninterrupted daily exposure," Yeary says. Repeated exposure to organophosphates or carbamates may cause a progressive decline in cholinesterase resulting in the inhibiting effects and symptoms mentioned. However, simple monitoring procedures can help prevent overexposure, according to Yeary.

TESTING FINDS SUSCEPTIBLE WORKERS

Cholinesterase monitoring programs can flag workers who become overexposed, permitting action to be taken prior to intoxication. Determining whether or not proper insecticide handling procedures are being followed is another goal of the program. Though measuring cholinesterase in the nervous system is not possible, blood samples can be analyzed to indicate the absorption of these insecticides. Chem-Lawn's Clinical Lab, which is licensed by the U.S. Public Health Service, uses a simple two-step procedure, analyzing a person's plasma and red blood cells.

First, the lab administers an initial test to establish a baseline or normal level of the cholinesterase enzyme in the worker.

"We recommend at least a 2-month lapse since an individual has had contact with cholinesterase-inhibiting insecticides," said Yeary. Secondly, periodic follow-up evaluations are given during and after exposure to detect if the level has dropped.

The ChemLawn monitoring program prescribes that a baseline should be established annually for all persons who have contact with cholinesterase inhibitors by surveying both red blood cells and plasma. Routine plasma tests are given at 3- to 4-week intervals, while comparing the results to the baseline value.

A full test report can be completed within a few days of acquiring blood samples. Regular cholinesterase monitoring may reduce both medical costs and liability expenses. But more importantly, increasing safety will ultimately boost commitment and morale of workers.

Reprinted from March 1991 *Farm Chemicals*

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*On Wednesday, June 16,
Kent Michaud & Caroline Michaud will welcome
the New Hampshire Plant Growers' Association
and its guests to a twilight meeting at
Michaud Nurseries & Greenhouses, Inc.,
on Route 85 in Exeter.*

The meeting will begin at 6 (not at 6:30, as previously stated) and last until dark.

Guests will have a chance to look over new additions to the Michauds' perennial line and see the new show gardens and recently installed irrigation systems.

The additions include new hosta varieties (over 30 are currently offered) and "a lot of hard-to-find stuff." The Michauds have always specialized in native plants and plants used for naturalizing—and there are new selections in these as well.

A lot of them will be displayed in recently constructed show gardens centered around a gazebo beside a small pond and waterfall.

As well as the new, there's plenty of high quality old to see as well. There's no official tour, but Kent and Caroline will be there to show you around and talk about new trends and plant varieties in "natural landscaping." There will be refreshments, so it should be a nice place to enjoy the twilight of one of the longest days of the year.

Michaud's Greenhouses and Nurseries are located on Route 85 (Newfields Road)—off 108 South from Newmarket and 101 East from Manchester—on the Exeter/Newfields line. For more information, call Caroline or Kent at 603-772-3698. 🌿

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