The Plantsman

NEW HAMPSHIRE PLANT GROWERS ASSOCIATION
February & March 1993

Keep it simple. See page 23.

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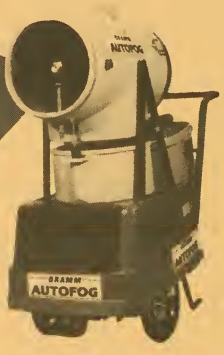

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CALENDAR

FEBRUARY

February 24 *Vermont Plantsmen's Association Winter Meeting*, Holiday Inn, Rutland, VT: Scott Pfister at (802) 244-7048.

February 25-28 *Hartford Flower Show*, Civic Center, Hartford, CT; for information: the Connecticut Nurserymen's Association at (203) 872-2095.

February 27 *The 4th Annual Connecticut Organic Landscaping Conference*, Naugatuck Valley Community-Technical College, Waterbury, CT; for information: NOFA/CT at (203) 484-2445.

February 28 *"Grow Organic Food!" —a Winter Conference for Farmers, Gardeners, and Consumers*, Naugatuck Valley Community-Technical College, Waterbury, CT: (203) 484-2445.

MARCH

March 1-3 *62nd Massachusetts Turfgrass Conference and 17th Industrial Show*, Civic Center, Springfield, MA: (413) 549-5295.

March 6 *NH Pesticide Applicator Training Session*, Fish & Game Building, Rte. 3, Lancaster, NH; for information: Faye Cragin at (603) 862-1169.

March 6-14 *Boston Flower Show*, Bayside Expo Center, Boston, MA; for information: the Massachusetts Horticultural Society at (617) 536-9280.

March 12-14 *Seventh Annual Seacoast Area Flower & Landscape Show*, the 'Old Channel Building', Lafayette Plaza, Lafayette Road, Portsmouth, NH; for information: Brenda Schure at (603) 436-0815.

March 16-17 *Third Annual New England Landscape Exposition*, Center of New Hampshire Holiday Inn & Convention Center, Manchester, NH; for information: Guy Hodgdon at 1-800-639-5601.

March 19-21 *Second Annual New Hampshire Orchid Show*, (AOS approved), Center of New Hampshire Holiday Inn & Convention Center, Manchester, NH; for information: Gordon LaBonte at (603) 627-5397.

March 27-28 *FTD Region 1 Convention*, Newton, MA; for information: Ray Savage at (603) 352-1155.

APRIL

April 2-3 *Twenty-third Annual University of New Hampshire Greenhouse Open House*, Plant Biology and Thompson School Greenhouses, Durham, NH; for information: George Estes at (603) 862-3205.

April 29 *NHPGA Twilight Meeting*, 5:30 pm at Kathan Gardens, Newport, NH; for information: Dennis Kathan at (603) 863-1089.

JUNE

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

JULY

July 14 *Connecticut Nurserymen's Summer Meeting*: (203) 872-2095.

AUGUST

August 3 *Massachusetts Nurserymen's Association Summer Meeting*: (508) 534-1775.

August 5-8, *American Association of Nurserymen Convention*, Dallas, Texas; for information: (202) 789-2900

August 12 *New England Nurseryman's Association Summer Meeting*, for information: Virginia Wood at (617) 431-1625.

August 18 *New Hampshire Plant Growers' Association Summer Meeting*, Eliot & 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 26 *Eighth Biennial Griffin Greenhouse and Nursery Supplies Open House*, Tewksbury, MA; for information: (508) 851-4346.

CONTENTS

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*.

AD SIZE	6x	1x
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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.

Overwintering Containerized Perennials

Peter van Berkum

Overwintering containerized perennials is probably the largest risk that a perennial grower faces. I think that more plants are lost during overwintering than during any other time in the season. Some plants just don't overwinter well in containers. Others do fine one year, than poorly the next, for no apparent reason. This makes identifying the problem much more difficult.

As fall approaches, I consider six factors which I feel are the most crucial to overwintering:

1) General plant health going into the winter.
2) Excessive cold.
3) Excessive heat.
4) Soil moisture.
5) Disease problems.
6) Rodent problems.

1) The health and well-being of the plant is the single most important aspect of its wintering successfully. An unhealthy plant probably won't overwinter no matter what you do to it. Tied in with the actual health of the plant is its condition in the pot. Some plants, (Alchemilla and Heuchera for example), overwinter very poorly if they are pot-bound, or more specifically, if their dormant eyes are crowded. Conversely, unestablished plants generally don't overwinter well. If we are potting up plugs from seed or cuttings, we like to get them into their permanent container in August or the first two weeks in September. After that, the chance of the plant's rooting-in diminishes, and they have a much harder time overwintering. Bare-root divisions with a hard crown (Hostas and Astilbes) can be planted into October and survive pretty well, but they won't be rooted in for early spring sale. Bare-root perennials with loose crowns (Achillea or Asters) should be potted up by mid-September.

2) *The main point in overwintering hardy plants is protecting them from extreme cold temperature.* Root-killing temperature varies from plant to plant, but for plants hardy in this area, when the soil temperature gets below 20 degrees F., root damage becomes a threat.

There are generally four ways to overwinter perennials in containers:

1) Under foam blanket. (ie. polyfoam or microfoam)
2) Under straw.
3) In unheated polyhouses, under foam blankets.
4) In polyhouses at low temperatures. (ie. 32 degrees F.)

So far, we have done all of our overwintering under foam blankets. We find it satisfactory, but not ideal. This entails putting all our plants pot-to-pot in beds that correspond with the size of the foam that we use, rolling the foam over it, rolling white polyethylene sheets over this, and weighting town the edges with the windiest day of the winter in mind. Good objects for weighting the blankets down include concrete blocks, old tires, logs, etc. A trick that we find helpful is to try to create troughs between the beds to hold snow and rain. When it freezes up it is the only secure means of holding the blankets down in high winds. We prefer to use the blankets that are 12 feet wide so we don't have to overlap narrower (6 ft. wide) blankets to cover the beds. Be sure that your beds are 3 to 4 feet narrower than your blankets so you have adequate material to hold down.

For a nursery trying to overwinter a small number of perennials, straw or salt-marsh hay would be ideal. Just sandwich 8 to 10 inches of straw between two layer of white poly and you have a good blanket. But on a large scale, the time needed to apply it and the question of what to do with the straw in the spring makes it impractical.

Unheated poly houses are getting much more use now. This entails narrow hoop houses (12 to 17 feet is usual) with white poly on them. Inside, the plants are set out just like before with the foam blankets. However the blankets don't have to be weighed down. Perhaps the biggest benefit to this is that there is air circulation under the blankets. This will be addressed in the disease discussion. University tests have found this method to be slightly more effective than straight blankets, perhaps giving a 1 or 2 percent better survival rate.

Overwintering in poly houses at minimal temperature, usually 32 degrees, can be effective, but the cost of heating the greenhouses makes it uneconomical.

3) Excessive heat build up brings up the question of when to cover and uncover the plants. This is the hardest decision of the whole process. If the plants are covered too soon, heat can build up under the blankets and damage the plants. If they are left on too long in the spring, heat buildup will cause the plants to put on a soft flush of growth under the blanket. Then, when you do uncover, this growth will be tender and will be killed by any freezing temperatures. (This soft growth can be hardened off by uncovering before 3 or 4 days of cloudy frostless weather or by rolling the blankets back over the plants before the nightly frosts for several days. This can be an immense task, depending on the size of your nursery.) What makes this all complicated is that if you wait too late in the fall or uncover too early in the spring, you run the risk of severe low temperatures that could cause root damage to the plants.

In New Hampshire, covering is done between the 1st and 3rd week of November, depending on the year and the grower. Uncovering is usually between the 1st and 3rd week of March. A rule of thumb that I follow is: in the fall when in doubt, cover early, and in the spring when in doubt, uncover early. Something that always worries me is quick drops in temperature in the fall—say, into the mid-teens. At what temperature do you risk root damage? This fall we kept a soil thermometer in some pots, with the sensor 1 inch below the soil line. When night temperatures dropped to 12 degrees in November for two nights, the soil temperature only went down to 29 degrees. Since this I've become much less concerned about sudden dips in temperature.

4) The wetness of the soil at the time of covering is important. Water is the main insulator around the roots. It is important that the soil be wet when the plants are covered. It is often suggested that the plants be irrigated the day before covering. Each time I try this, I end up with a bunch of frozen sprinklers. Lately I have depended on fall rain to wet the plants. I try to time the covering within 2 or 3 days of a good rain.

5) Disease can be a big problem in overwintering. Under the blankets there is plenty of moisture and no air circulation. This is one of the big advantages to overwintering in unheated poly houses with blankets. Since the blankets are out of the wind, they don't have to be weighted down, so the edges can be left open to allow air circulation.

The first step to disease prevention is to remove as much of the foliage as is possible. We use a string trimmer and cut all the deciduous plants back. Be sure that the person running the string trimmer is familiar with the plants: you don't want them cutting back your evergreens or the above-ground eyes on plants like Heuchera. After cutting back, we rake all the beds. Some nurseries use backpack blowers for this.

The other thing we try to do is to keep the blankets off the evergreens. We do this by either laying the plants on their sides if they are tall or rigid (Iberis), or by putting inverted plant trays over the foliage. I choose trays with a mesh bottom to allow more light to get through. We do this on Vinca, *Phlox stolonifera*, and other low-lying evergreen plants.

Fungicides are also widely used. However we have found no appreciable benefit from using them. I would like to experiment with using anti-desicants on the evergreens. This is being used successfully by some nurseries.

6) Mice can cause devastation to overwintering plants. Our first line of defense is to keep mouse traps set in the nursery for a month before the cover-up. We feel that this greatly reduces the populations. We put a trap every 15 or 20 feet. Just before covering, mouse bait should be spread. Either poisoned grain or paraffin blocks of rodenticide can be used.

In summary, the most important thing seems to be getting familiar with the different plants. I think in the future we will overwinter some difficult plants in poly houses with foam blankets. Also getting familiar with the sensitive evergreens and learning which form of overwintering works, or how to best keep the blankets off the foliage, will be valuable to us. Advice from other growers and professional journals has helped us a lot. But trial and error has been our best teacher, and each year we learn a few more tricks.

Peter and Leslie van Berkum own and operate van Berkum Nursery, 4 James Road, Deerfield, NH 03037. For further information, call them at (603) 463-7663.

Welcome, New Members!

James Barr
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Manchester, NH 03109
(603) 627-6599

Amy Juchatz, New Hampshire Division of Public Health
6 Hazen Drive
Concord, NH 03301
(603) 271-4664

LAN Nurseries
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Magog, Quebec J1X2K4
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Miltimore's Greenhouse
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Bedford, NH 03110
(603) 472-5092

Petty Brook Nursery
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(603) 838-6312

Plants Alive, Inc.
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Bennington, NH 03342
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2211 Peacock Road
Richmond, Indiana 47374

New Hampshire Orchid Society

FORUM

Thanks Go To....

...the speakers who donated their time and energy to make the NHPGA's Pesticide Applicator Recertification Program on November 12 a success. These include Donald De Wess, OSHA; Jeffrey Gagnon, NH Dept of Safety; Amy Juchatz, NH Division of Public Health Services; James Zerblocky, Grace-Sierra; and Steve Zimmerman, Valent USA Corporation. Also thanks go to Bob Demers, Jr., who played a major role in organizing the whole thing. There was no official head count, but it over fifty people attended and received credits. For NHPGA members, the program was free.

...Don and Dave Murray, hosts of a NHPGA Twilight Meeting at Murray Farms Greenhouses, Penacook, on November 19. Over thirty people visited, saw the innovative benching, the chip-burning boiler, the climate control system....

Co-host Don Murray said he felt it went really well. He was pleased with the turnout and said that people lingered long after the event was officially over, talking about DIF and raising poinsettias.

...Jolly Farmer Enterprises for plant material donated to decorate the NHPGA booth at the Eastern Regional Nurserymen's Association Trade Show at the Concord Hotel, Kiamesha Lake, New York, this past January. And thanks go to Chris Robarge, who brought the display out there and manned it for the three days of the show.

Flower Show 1994

Real Fallu, Vice-President GSGFS

As vice-president of the Granite State Garden and Flower Show, I received a letter several weeks ago from the board of directors of NHLA stating that the association wants to withdraw from the flower show corporation. Don Tordoff and I attended a NHLA board meeting to address the issue. One of the reasons given for the possible withdrawal was lack of interest on the part of NHLA members, financial responsibilities, volunteer time limitations. Is this lack of interest real, or are there NHLA members still interested in being part of the Granite State Garden and Flower Show?

GSGFS is going through a transitional period. There has not been a show in two years. We are currently planning the 1994 show. The days of large, expensive exhibits are over. We recommend smaller exhibits, 200 to 400 square feet, perhaps in conjunction with another exhibitor. With reimbursements from the receipts of the show, it is possible to do such an exhibit with very little cost to the exhibitors. Workshops on construction of exhibits and forcing plant material will be offered for first-time exhibitors.

Another major concern of the GSGFS board is funding the show itself. Several members are investigating the possibility of corporate sponsorship. A plant sale fair has been scheduled for July, 1993, with proceeds going to the GSGFS. Other fund-raisers will be held to raise the necessary money.

Why should you participate in the flower show? These are just a few of the reasons...

- The challenge
- The competition
- To promote plant and construction materials
- Working together with other companies in your profession
- Great advertisement and exposure
- Educational growth
- Giving something back to the community
- If for no other reason, just for the fun of it during the off-season.

Let's keep the flower show local. Great efforts have been put into the flower show over the years. We don't want it to become extinct. We welcome new ideas and new faces. Please contact Real Fallu, 497-4060, or Don Tordoff, 623-4313, for mor information about our next meeting.

NHPGA Scholarships Awarded

This year's New Hampshire Plant Growers' Association scholarships, of $750 each (larger than usual, thanks to a very successful auction at the summer meeting), were awarded at the association's Winter Meeting on January 13.

One recipient is from the four-year plant biology program at UNH; the other is from the two-year Thompson School program. This year the Plant Biology recipient was Jobriah Anderson, from Barrington, NH. Jobriah's a junior in the Horticulture/Agronomy program "gearing my education toward ornamental plants as I would like to go into that field, either by doing landscape design and implementation or by eventually starting my own nursery and greenhouse...up to this point I have paid my way through school through student loans and paid my student living expenses through a series of part-time jobs. As part-time work in this field is hard to come by in the winter months, this scholarship would be extremely timely and greatly appreciated. Your contribution would help me in achieving my goals and quite possibly add a future member to your organization."

The Thompson School recipient is Madeleine Duhamel, also from Barrington. She wrote, "My experience and personal discoveries in the field directed me toward greenhouse propagation...upon completion of the Thompson program, I hope to transfer into the four-year Plant Biology program." Upon finishing there, "I hope to pursue a greenhouse operation of my own focusing primarily on growing cut flowers, perennials and wildflowers. And begin attempts with hybridizing. When financially solvent, I will focus my commitment on the development of a successful hybridization operation."

Congratulations to both recipients and thanks to everyone who made this year's auction so successful.

Pesticide Applicator Training

For those of you who wish to obtain a private pesticide applicator's permit, UNH Cooperative Extension is holding two training sessions this winter. The first (which may have already been held by the time you receive this) is on February 13 from 8:30 to 4 at the UNH campus on Commercial Street in Manchester. The second will be held on Saturday, March 6 from 8:30 am to 4 pm at the new Fish & Game building on Route 3 in Lancaster.

The cost (including the training manual) is $50. If you already have the manual, the cost is $25.

These sessions are designed to instruct people who have not been certified to apply pesticides. They can also serve as refreshers for people who have let their permits lapse and need to retake the exam.

An exam, given by a representative from the New Hampshire Pesticide Control Board, will need to be taken following the training session. Passing this exam will allow you to purchase and apply restricted-use pesticides in the state of New Hampshire. Exams will be given at 7 pm on February 22 at the Pine Island 4-H Outdoor Education Center, 2849 Brown Avenue, Manchester, and on February 25 in Durham, March 15 in Lancaster, and March 17 in Woodsville.

For information on registration and the purchase of a manual, contact Faye Cragin, Department of Entomology, UNH, at (603) 862-1159.

An SBA Grant for a Third Year for the State of New Hampshire

On December 16, 1992, US Small Business Administration (SBA) District Director William Phillips announced that a grant totaling $68,560 had been awarded by the SBA to the State of New Hampshire for the third year of the federal government's national tree planting program. The amount of the grant is based on the state's total population.

Under the Natural Resources Development Program, an amendment to the Small Business Act, federal dollars for tree planting on state or local government land are made available to states which agree to match at least 25% of the federal grant. In addition, any state or local government which participates **must** utilize small businesses as contractors.

A total of more than $30 million was divided among the fifty states, Puerto Rico, and the District of Columbia during the first two years. New Hampshire received almost $130,000. Alton, Berlin, Concord, Dover, Hampton Falls, Manchester, Mont Vernon, New Ipswich, North Woodstock, Northumberland, Orford, Portsmouth, Rochester, Rumney, Somersworth, Amherst's Souhegan Valley School District, Wolfboro, and Woodstock were the communities that applied for and were selected to receive these funds.

The deadline for fiscal year 1993 funds was February 12, 1993. Questions should be directed to Mary Reynolds of the NH Division of Forests & Lands at (603) 271-2214.

Information Sheets Available

Two information sheets on on-farm composting are now available from UNH Cooperative Extension. Compiled by Nancy Adams, Extension Educator, Rockingham County, one is a general fact sheet; the other, a checklist reviewing aspects of the site, local regulations, organic materials, and equipment needed.

For further reference, both sheets recommend the *On-Farm Composting Handbook*, NRAES-54, Northeast Regional Agricultural En-

gineering Service, 152 Riley-Robb Hall, Cooperative Extension, Ithaca, NY, 14853-5701. This 186-page book costs $15.00.

First Draft Reviewed

A first draft of the New Hampshire State Pesticide Management Plan (SPMP) for the Protection of Groundwater was recently sent to various NH state agencies and private horticultural organizations for their comments and suggestions.

Mandated by EPA in response to the federal government's groundwater policy, state management plans of this type will be required in order to continue the use of certain pesticides. The EPA is providing financial and technical assistance, but is allowing each state to take the lead role in developing a management plan tailored to meet its own specific conditions.

The NH plan, the result of efforts of the Pesticide Control Board, the State Pesticide Management Plan Advisory Committee, and the Division of Pesticide Control, is a compilation of topics reviewed in committee and presented to the Board over the last two years.

The first draft of this plan is a hefty, nearly 200-page document with chapters on such topics as 'Response to Detection of Pesticides,' 'Monitoring,'and 'Public Awareness and Participation.' Members who might like to look it over should contact either Jeff Huntington (603-435-8361), Chris Robarge (603-862-1074), or the NH Division of Pesticide Control (603-271-3550). Although it's too late to comment on this draft, there will be other drafts and other opportunities to comment.

Showtime '93

The road to spring, usually marked by a smoothly-spaced series of flower shows and expositions, seems to have a few more frost heaves than usual this year.

★

The efforts to revive the Granite State Flower Show continue, in spite of new obstacles. In November, the Board of Directors of the NH Landscape Association voted to withdraw from the corporation of the Granite State Garden and Flower Show. Limitations in time and money were cited as reasons.

The NHLA was being asked to reconsider by the two other corporation members, the NHPGA and the NH Federation of Garden Clubs.

A quorum did not attend a corporation's meeting on January fifth, and a new meeting was called for January 28.

For more information—and if you would like to participate—by exhibiting—or by volunteering some of the time and effort needed to create a successful 1994 show, contact Bob Demers, Jr., at (603) 625-8298.

★

It wasn't until January 15 that the Seventh Annual Seacoast Area Flower & Landscape Show finally had a home. With a theme of "Springtime in New England," the show will be held on March 12-14 at the 'Old Channel Building,' in Layfayette Plaza, Lafayette Road, Portsmouth, NH.

Until mid-January, most of the energy had gone into finding a location (two locations at Pease Air Force base and a variety of empty commercial properties had been either unavailable or too expensive), so there wasn't much information then about other aspects. There will be "more than adequate parking" and a big retail space and there are plans to be "bigger and better than ever."

A lot can happen in two months and the show promises to be a major horticultural event in the Seacoast Region.

For updates and information, call Brenda Schure at (603) 436-0815.

★

The Third Annual New England Landscape Exposition, sponsored by the New Hampshire Landscape Association, is being held in Manchester on March 16-17 at the Center of New Hampshire Holiday Inn and Convention Center in Manchester. Highlights include the trade show, a variety of educational lectures, raffles, a buffet on Tuesday, the Pearson Awards (with slides of the actual work being honored) at a more formal dinner on Wednesday, pesticide recertification credits (for all six NE states), and

an expanded time to view the trade show and exhibits.

The keynote speaker (on Wednesday afternoon) is James van Sweden, a member of the design firm of Oehme/van Sweden Associates of Washington, DC, and subject of a book entitled, *Bold Romantic Gardens: the New World Landscapes of Oehme and van Sweden*, published in 1990. (In 1991, the book was given two Awards of Excellence by the Garden Writers of America.) van Sweden's topic will be, "Bold Romantic Gardens."

Other speakers include Steven Frowine of White Flower Farms speaking on, "What's New for American Gardens."

Preregistration for both days is $45 ($50 at the door); preregistration for one day is $30 ($35 at the door).

For more information, contact Guy Hodgdon at 1-800-639-5601.

★

Right after this, orchids are spotlighted. Buoyed by the success of last year's American Orchid Society (AOS)-approved New Hampshire Orchid Show, the New Hampshire Orchid Society is planning a second show. It will be held at the Center of New Hampshire Holiday Inn & Convention Center in Manchester on March 19-21.

This year there's 25,000 square feet of space—as opposed to last year's 4000. Gordon LaBonte, the show's chairperson, says he expects a lot of the people who showed last year to come back—"and there'll be a lot of new people from all over the country here as well." New exhibitors will include The New Hampshire Federation of Garden Clubs, Teleflora, and Garden Clubs of America. Representatives—and hopefully, exhibitors—from orchid societies in Ottawa and Montreal are also expected to attend.

For information, contact Gordon LaBonte at (603) 627-5397.

(This is the Tenth Anniversary year of the New Hampshire Orchid Society. It was begun in June, 1983, by Paul Sawyer, operator—with his wife Elaine—of Sawyer's Exotic Greenhouses in Grafton. The original membership of ten people has grown to today's 150. And Paul is still organizing—he recently started the Twin-States Orchid Society, which meets in Rutland, Vermont, and caters to orchid growers in eastern Vermont and western New Hampshire.)

★

The Twenty-third Annual UNH Greenhouse Open House, sponsored by the Plant Biology Department and the Thompson School of Applied Science, will be held April 2-3 at the greenhouse complex on Mast Road in Durham. Although perhaps somewhat lower-key than in the past, the show's theme is "Biology in Action" and there will be a mix of lectures, displays, a free soil-testing service, and plant sales, with instructors from both schools there to answer questions. For information, contact George Estes at (603) 862-3220. ❧

New Products—Vermont

A new series of growing mixes is now available for New Hampshire Growers. The series, called "Nutripeat," was developed from agricultural compost by Vermont Natural Ag Products, Inc., from Middlebury. These mixes simulate the texture of peat moss and when combined with peat moss, "give growing performances comparable to the most highly regarded commercial mixes on the market today." The products are "generally more wetable than peat moss and therefore require less water and fertilizer than other peat-lite mixtures on the market and can reduce the cost of production."

Five mixes are offered. There is a germinating and transplant mix (a blend of vermiculite, peat moss, and composted cow manure) and two perennial mixes. The more-finely textured of these (cow manure compost and New Hampshire brown peat humus) is recommended specifically for outside container production; the second—lighter—mix (horse manure bedding and ground bark finished compost blended with Canadian spagnum peat moss) is designed for general greenhouse use.

There are two nursery mixes. Bulk loads and big bags of the first (composted horse manure and New Hampshire brown peat humus) can be individually blended to include washed sand and/or slow-release fertilizer. The second (horse manure bedding, woody yard waste, and "high quality, high nitrogen food and municipal residues") is a media that, when mixed with peat humus and washed sand, will be heavy enough to keep tall stock upright in a strong wind.

Vermont Natural Ag Products, Inc., has an interesting history. About a decade ago, Foster Brothers Farm, Inc., a dairy operation in Middlebury, Vermont, looking for ways to keep the family business strong, started producing electricity

Banana tree

from cow manure. The electricity produced was used to run the farm and the rest was sold to a local utility. To do this, the Fosters built an "aneorbic generator," which is described as "a large incubator for methane-producing bacteria which thrived on the cow manure the Fosters put into the digester on a daily basis." The methane gas produced was used a source of fuel for electrical generation.

The innovations continue. When the manure was done cooking, the Fosters removed it, and separated the liquids from the solids. They began using the liquid as plant food and spreading the solids on their crop land. Both were nearly odorless, weed-free, and without the nitrogen toxicity associated with fresh manure.

Vermont Natural, beginning where the Foster family left off, created a variety of digester byproducts and began marketing them as the "Moo" line—Moo Doo, Moo-Nure, Moo Mix, Moo Start, etc., in retail-size 10, 20, and 40-pound bags. They've recently begun producing Moo Juice, a liquid plant food.

The most recent development has been the production of the Nutripeat line of mixes in commercial quantities. Nutripeat is a new product and "although we at Vermont Natural have tested and/or are testing the comparative commercial performance of Nutripeat, not all cultivars have been tested in all circumstances. Unforseen problems may develop. Because we cannot be responsible for damages of any kind, we recommend that the user trial a free sample prior to using it on an entire crop. If that is successful, we recommend the user trial a larger amount on part of his crop before using Nutripeat on an entire crop."

Sounds fair. For more information, call Don Brumfield at (802) 388-0156. Or write him at Vermont Natural Ag Products, Inc., 559 Lower Foote Street, Middlebury, Vermont 05753.

UMass Cooperative Extension 1993 Landscape and Nursery Integrated Pest Management (IPM) Workshop Series

Three workshops ("Common Insects & Mites on Woody Ornamentals," "Common Diseases of Woody Ornamentals," and "Managing Soils Today") and one twilight meeting ("IPM Scouting Techniques") are being offered by UMAss Cooperative Extension. Each is offered three times, each time in a different part of the state.

The January meeting dates have already passed, but "Insects" is being offered March 15 in Waltham and March 24 in East Wareham; "Diseases" on March 16 in Waltham and March 17 in East Wareham; and "Soils" on March 16 in Waltham. The $60 fee for each 9:30-3 workshop includes coffee and a box lunch.

The twilight meeting is being held 5-7 on May 12 in East Wareham, May 19 in Waltham, and May 26 in Amherst. Pesticide credit is offered; the fee is $30.00.

For information, contact Kathleen Carroll at (413) 545-0895.

Methyl Bromide Update

(from AAN Update, December 14, 1992)

An EPA proposal which would list methyl bromide as an ozone depleter under the Clean Air Act appar-

ently calls for a 1993 production freeze at 1992 levels and a complete phase-out by the year 2000. Methyl bromide's future use will be more uncertain under a Clinton/Gore administration. Meanwhile, scientists are not in full agreement over methyl bromide's depletion threat and agricultural groups have emphasized the chemical's importance in nursery production.

(Approximately 64 million pounds of methyl bromide were used in the US in 1990. Roughly 84% was used in soil fumigation; 8% for structural fumigation, and 8% for commodity treatment.)

Cool & Green in '96

(from *Keeping Posted*, the Southern Nurserymen's Association Newsletter, Oct-Dec, 1992).

Another major tree planting campaign is underway. This one's being organized by The Georgia Trees Coalition, a "broad-based group that has been assembled for what may be the nucleus of Olympic fever in landscape renovation and 'sprucing up' for the 1996 Summer Olympic Games to be held in and around Atlanta."

The Coalition is made up of "nonprofit tree action groups," the Georgia Urban Forest Council, a number of municipal, county, state and federal agencies, the Atlanta Committee for the Olympic games, the Southern Nurserymen's Association, and the Georgia Green Industry Association.

These people have determined that over "25,000 empty tree spaces exist along highly visible Olympic corridors and at major event sites." To achieve the greatest visibility for 1996 in a cost-effective manner, trees must be planted now. "To channel the energy and enthusiasm of hundreds of Olympic volunteers toward trees," a total of 4.7 million is needed to purchase and plant 25,000 four-inch caliper trees.

John Mixon, chairman of the Georgia Trees Coalition, said, "We want to make a big impression on the millions of visitors that will be coming to the Olympics. We want to be known as a major tree capital."

Not a New Whitefly, but a Different One

(from *NY Times*, January 5, 1993).

The whitefly that has destroyed more than a half million dollars' worth of crops in California and other states is another species than had been previously thought, scientists say, and the discovery could speed the search for a natural enemy to control the insect.

Scientists previously believed that the sweet potato whitefly was responsible for the crop damage, and they have been searching for the natural enemy, presumably a parasite, in the bodies of a number of strains of outwardly identical sweet-potato whitefies collected from around the world. Typically, only one variety of parasite attaches itself to only one variety of whitefly.

Now. Dr. Thomas M. Perring and colleagues at the University of California at Riverside have determined through genetic studies and behavioral analysis that the crop damage was caused not by a strain of sweet-potato whitefly, but rather by a look-alike that is a separate species. It has been preliminarily dubbed the silverleaf whitefly.

In searching for a natural enemy that might control the flies, researchers have until now looked in the field for flies that looked like the sweet potato whitefly. The natural-enemy parasites, contained in the flies' pupae, are taken back to the laboratory and, under quarantine, are reared and tested to see how well they control the destructive type of whitefly.

This is a time-consuming process, Dr. Perring points out, and the isolation of the silverleaf species could speed it up. Now, he says, it will be possible to screen the whitefly specimens first to see if they are silverleafs. If so, the testing can proceed more quickly.

PPGA HIGHLIGHTS
continued

Buyers Guide for Plant & Greenhouse Supplies Available—Free

"Landscapers, growers and garden center managers on the look-out for new suppliers of plant material for resale or landscape design, plugs and liners for finishing, or greenhouse equipment will want to check out the new PPGA's 1992-93 Buyers Guide—available free on request."

To obtain a copy, write to PPGA, PO Box 27517, Lansing, MI 48909-0517; or call (517) 694-7700.

Warning Signs that Comply with Latest EPA Worker Protection Standards

The EPA has published new protection standards for agricultural workers in the August 21, 1992, Federal Register. Section C of these new regulations makes existing pesticide warning signs obsolete.

These regulations give specifications for size, color, illustrations, wording, and lettering size. PPGA has developed a new warning sign in accordance with these posting requirements. It is bright red and black, 14x16" unbreakable plastic, drilled for easy hanging, and includes warnings in both Spanish and English. Each sign is $7.00 ($9.00 for non-PPGA members), plus shipping and handling. Quantity discounts are available.

For information, call PPGA at (517) 694-7700.

EPA's

Worker Protection Standard Respirators and "-Cides."

Leo Traverse

This two-part article deals with Air Purifying Respirators and is written for informational purposes only.

WORKER PROTECTION STANDARD

EPA's Agricultural Standard requires the use of PPE (Personal Protective Equipment). PPE involves head-to-toe protection. Under this new standard, the employee must supply PPE when specified by the product label on pesticides. EPA is putting the burden of informing you what personal protective equipment is required on the pesticide's manufacturer. You will find the labels to be extremely safeguarding (this also safeguards the manufacturer's liabilities should a worker become ill).

This new standard took effect 10/20/92. (For more information about this standard, contact Jim Boland, EPA, at 703-305-7666 or Murray McKay, NH Department of Agriculture, at 603-271-3550.) However, deadlines for compliance with some provisions are not until 1993 and 1994. For example, April 21, 1993, is the compliance deadline for a number of provisions involving labeling of pesticides, entry restrictions (such as in greenhouses), and worker notification about pesticide applications.

EPA is mandating eight areas of responsibility for pesticide users. This article deals with only one part (Air Purifying Respirators) of one section of the PPE requirement for worker safety.

LIABILITIES

Outside help can be a liability to business owners in more ways than one. Hiring outside help (immediate family members are exempt) creates "Hazard Communication and Awareness" responsibilities for the owners of all businesses using hazardous materials. Employees could bring legal action against your company if they sustain injuries (immediate or long-term). If you haven't been a good corporate citizen and not abided by EPA/FIFRA regulations and label warnings, your employees might be able to develop a good case. Proper paperwork and records are a MUST when dealing with pesticides. Good records show your diligence and concern.

Even though these responsibilities are touted as EPA-mandated, a business owner would be very wise to follow the OSHA regulations on respiratory protection. These OSHA regulations demand written plans, training (with records), fit testing (with records), and maintenance and decontamination procedures. They strongly recommend medical surveillance.

By doing these things, you'll protect your assets against sharp lawyers who know the regulations and, most importantly, protect your employees against any health hazards associated with pesticides.

RESPIRATORY PROTECTION

Respiratory protection is an important part of PPE and is now required when using certain labeled pesticides. Proper choice, use, and care of respirators is not as easy as you might think. ANSI (American National Standards Institute) sets careful requirements for respiratory protection (ANSI Z88.2-1980). MSHA (Mine Safety and Health Administration) and NIOSH (National Institute for Occupational Safety and Health) are the certifying agents for respirators worn in dangerous situations. Although respirators listed by the US Department of Agriculture continue to be acceptable for protection from specified pesticides, the US Department of Interior, Bureau of Mines, is the agency now responsible for testing and approving pesticide respirators. In other words, you can't go down to your local hardware store and pick out just any respirator.

RESPIRATOR TYPES

A). Air Purifying Respirators (APR)

1). 1/2 Face Air-purifying Respirators (APR)
2). Full-face Air-purifying Respirators (APR)
3). 1/2 Face Powered Air-purifying Respirators (PAPR)

4). Full-face Powered Air-purifying Respirators (PAPR)
5). Helmet/Hooded Powered Air-purifying Respirators (PAPR)

B).Supplied Air Respirators (SAR)
1). Self-contained Breathing Apparatus (SCBA)
2). Air Line Respirators

YOUR PROTECTION FACTOR

Respirators are assigned Protection Factors (PF). A protection factor lets the user know how much of the contaminant *can be expected* to leak into his nose, throat, and lungs. For example, a 1/2 face respirator is given a PF of 10. This means that if the area has 1000 parts per million (ppm) of a pesticide vapor, only 100 ppm will potentially be in the face piece. (This assumes you have the correct cartridge on the face piece and that it fits you properly!)

If the material against which you are protecting yourself might have harmful effects on your eyes, a wise choice of respiratory protection would be a full-face respirator which covers the eyes. Full-face respirators have a PF of 100. Using the example above, you would potentially have only 10 parts per million in your face piece.

CHOOSING A RESPIRATOR

In order to safely choose, use, and care for respirators, you must: (A) identify the contaminant(s); (B) identify the chemical and physical characteristics of the material; (C) identify the toxicity of the end-use product; (D) identify the levels of contamination in the air; (E) ensure that the levels of oxygen are at least between 19.5 and 22%; (F) be aware of any other conditions that may injure a respirator user; and finally, (G) properly fit and (H) train APR users.

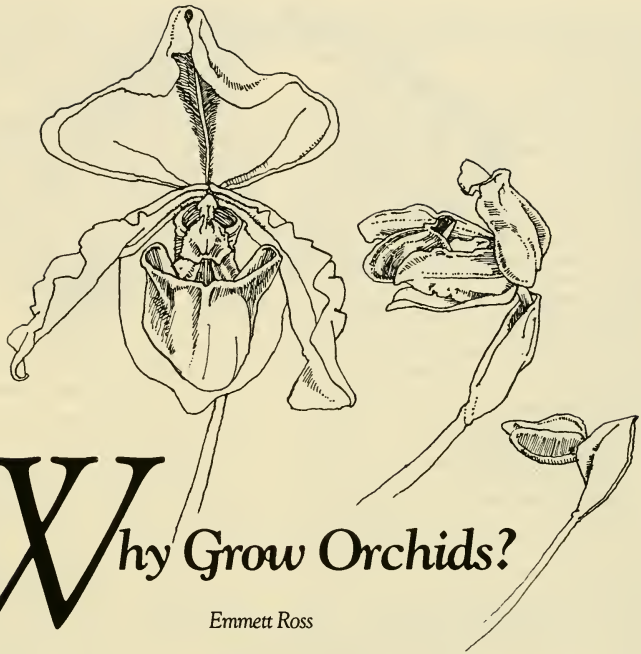
A). Identification of Contaminant(s):
Pesticide, Biocide, Bactericide, Herbicide
"-CIDE" To Kill

These materials are specially batched, compounded, and prepared to kill certain organisms. Their main function is to kill insect pests, bacteria, plants, etc.

B). Chemical and Physical Characteristics:
a).Solids
Solids applied as solids
Solids diluted with water
b).Gases
Gases applied outdoors
Gases applied indoors
c). Liquids
Water-based
Solvent-based
d). Combination of above
Fumigants

The second part of this article will discuss the new EPA toxicity categories assigned to pesticides, maximum-use limitations of respirators, employer responsibilities, cartridge color codes, and the requirements for a minimally acceptable respirator program. In the meantime, please try to avoid using the five compounds identified by the EPA as real troublemakers for users/ employees. These are responsible for 40% of occupationally related illness: Parathion, Diazinon, Phosdrin/Mevinphos, Methyomyl, and Omite Propagite.

Leo Traverse is a Certified Environmental Trainer and President of Hazmateam, Inc. Hazmateam is located in Hampstead, NH, and provides Personal Protection Equipment (PPE) training, respiratory protection plans, safety plans, respirator training, and monitoring. For information, call Leo at 603-434-2051.



Why Grow Orchids?

Emmett Ross

For those of you who might have read my article on orchids last year and were enticed to try and grow a plant or two, this is the time of the year that the fruits of your labors will be yours to enjoy. All of the different types of orchids that I had mentioned should be, or shortly will be, in bloom. These cold dark days of our winters are an excellent time of the year to be rewarded with those exotic moth-like blooms of the phaleanopsis dancing on a long inflorescence. Or possibly, you are lucky enough to have a bouquet of cattleya blooms, commonly represented as the corsage orchid. What could be more appetizing to the senses than having a five-inch bloom in hues of purple or white filling your growing area with an intoxicating perfume? Then, if you had indulged in perhaps a cymbidium or two, your blooms would soon be coming. Their blooms are more earth-toned as well as having yellows, reds, and greens.

Orchid growing throughout the years has always presented the grower with challenges. What is the allure that keeps us interested and continually trying to meet these new challenges? First and foremost is the fact that probably no one person could ever grow all of the 35,000 or so species of orchids in one life time. So from such a vast field of plants from which to chose, there will most certainly be some that are suitable to almost any growing condition.

This diversity of flower morphology contributes to orchid interest. For instance, there are oncidiums that, when in bloom, simulate a bee swarm by producing a spray of hundreds of blossoms that quiver with the slightest breeze. During the course of evolution, this system was devised to antagonize a passing bee into attacking the "swarm" and thereby initiate pollination.

Oncidium *papilio*, the butterfly orchid, bears a single flower displayed atop a four-foot stalk. The top two petals and one sepal rise like long yellow and brown antennae with the remaining flower segments arranged to resemble a butterfly.

Angraecums have predominantly white star-shaped flowers that look as though they were carved out of wax. They contain a nectary at the end of a spur that is active at night. When Darwin observed Angcm. *sesquipedale*, with its 12-inch spur, he predicted that there was a moth with a 12-inch proboscis that was its pollinator. This moth was finally discovered in the 1920's. This orchid is also known as the Star of-Bethleham orchid as it blooms faithfully during the Christmas season.

Anguloa *clowesii* is also referred to as the tulip orchid for just reasons. Their sepals have a cup shape that resembles the tulip. Maybe I could interest you in a miltoniopsis (or

pansy orchid). There are now available hybrids of this variety in reds and whites with what appears to be a waterfall cascading down the lip all this in a four-inch flower and on a seven-inch plant.

Are you interested in our own native slipper orchids? They are not adaptable to cultivation, but South American and Asian varieties are. Phragmipedium *caudatum* has petals that can be two-feet long. They will stop growing when they reach the ground. This mechanism evolved to facilitate pollination by terrestrial insects. Asian phaphiopedilums can be just as spectacular with some forms having huge pouches as though they were blowing bubble gum.

There are some orchid growers that specialize only in miniatures. These orchids are usually the most challenging, like bonsai growing. The flowers from these plants can usually only be appreciated while being viewed through a magnifying glass and a thimble can serve as a pot.

Admittedly, orchids out of bloom are not what could be called a pretty plant and are affectionately known as "cabbages" among orchid growers. However there are some orchids that are grown for their foliage, and are referred to as jewel orchids. Their leaves are nicely variegated with a velvety purple sheen, sometimes with red or gold veining.

This article asks the question: Why grow orchids? Along with the sensual and cerebral reasons that I have mentioned, most commercial growers will be interested in their economic value. Some orchids serve as excellent cut flowers as well as pot plants. They are capable of holding their blooms for months. Modern breeders are now producing groups of orchids in more vibrant colors and hues. Intergeneric hybridizing with miniature laelias, sophronitis and broughtonias has also reduced the size of the cattleya plants, making them more adaptable to home light or window sill culture. For instance, the late Dick Valentine of Wolfboro, New Hampshire, was known throughout the world for his early-blooming miniature cymbidiums. By selective breeding, the plant size of this genera was reduced while still retaining an impressive flower size. Many of his varieties are commercially available with 'Valentines Love' being one of the more famous.

I hope I have stimulated at least some interest in orchid culture and/or ecology. I invite you to broaden your horizons and open your growing space to orchids. There are serious, capable, and successful orchid growers throughout the New England area to prove my argument.

So next spring I hope to meet some of you in some bog observing our native orchids or at least attending the next New Hampshire Orchid Show.

Again I invite everyone to the New Hampshire Orchid Society Meeting in Manchester. Good growing!

Emmett Ross grows and hybridizes his orchids at Cape Neddick Gardens, PO Box 272, Cape Neddick, ME 03902. He is currently a graduate student in Plant Biology at UNH, Durham. He can be reached there at (603) 862-1114.

TIPS
From the Griffin Guru

YOUR PARTS DEPT.

At a recent seminar, I heard a speaker touch upon this subject and I would like to pass on his comments for your consideration.

What have you got stocked in your Parts Dept. that would handle a malfunction at 3 AM some dark morning? The average greenhouse uses a wide variety of motors and switches and valves and other unique stuff. Some of which is hard to replace even when it's not 3 AM.

First thing to do—walk though each part of your operation—boiler room, headhouse, each greenhouse. List all the working equipment by location from thermostats to oil burners to pumps. Note the model and/or part number of each. You might even write down where it was obtained. This will be of great value to you when a problem develops. Time will be saved. Also, it will be a handy reference for your back-up person if you're not on site. The other suggestion would be that if you have online a number of the same pumps or thermostats, etc., you might consider putting a back-up in your Parts Dept.

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SPECIES	AGE	SIZE	100-249	250-499	500 &UP
BALSAM FIR	2-3	12-18"	1.36	.95	.68
	3-2	9-15"	1.30	.91	.65
	3-0	6-12"	.36	.25	.18
CONCOLOR FIR	2-2	9-15"	2.10	1.45	1.05
	2-2	6-12"	2.00	1.40	1.00
DOUGLAS FIR					
Lincoln	2-2	15-24"	1.20	.84	.60
	2-2	12-18"	1.10	.77	.55
	2-0	8-14"	.28	.20	.14
Apache	2-0	6-9"	.24	.17	.12
British Columbia	2-0	6-9"	.24	.17	.12
FRASER FIR	3-2	9-15"	1.20	.84	.60
	3-0	6-10"	.40	.28	.20
EASTERN WHITE PINE	2-2	9-15"	1.20	.84	.60
	3-0	9-15"	.40	.28	.20
SCOTCH PINE					
French	2-1	6-12"	.96	.67	.48
	2-0	4-8"	.24	.17	.12
	2-1	6-9"	.96	.67	.48
	2-0	4-8"	.24	.17	.12
COLORADO BLUE SPRUCE	2-2	9-15"	1.30	.91	.65
	2-0	6-9"	.24	.17	.12
NORWAY SPRUCE	2-2	12-18"	1.16	.81	.58
	2-0	6-12"	.24	.17	.12
WHITE SPRUCE	2-2	12-18"	1.16	.81	.58
	3-0	12-18"	.40	.28	.20

PLUG STOCK

Minimum Order: 4 trays (2 of same variety)

SPECIES	AGE	SIZE	2-6 TRAYS	8 TRAYS & UP
BALSAM FIR	P2	4-7"	.57	.37
CONCOLOR FIR	P2	4-7"	.57	.37
FRASER FIR	P2	4-7"	.57	.37
EASTERN WHITE PINE	P2	4-7"	.57	.37
SCOTCH PINE				
Lake Superior	P2	4-7"	.57	.37
COLORADO BLUE SPRUCE	P2	4-7"	.55	.35
NORWAY SPRUCE	P2	5-10"	.57	.35
WHITE SPRUCE	P2	5-10"	.57	.37
SERBIAN SPRUCE	P2	5-10"	.57	.37

Container-grown seedlings come in trays of 67 cavities each and are shipped either in 2 or 4 tray boxes. Therefore, we request that you order an even number of trays. There is a container deposit of $3.35 per tray which is refundable upon return of the containers in good condition within 60 days at the expense of the purchaser.

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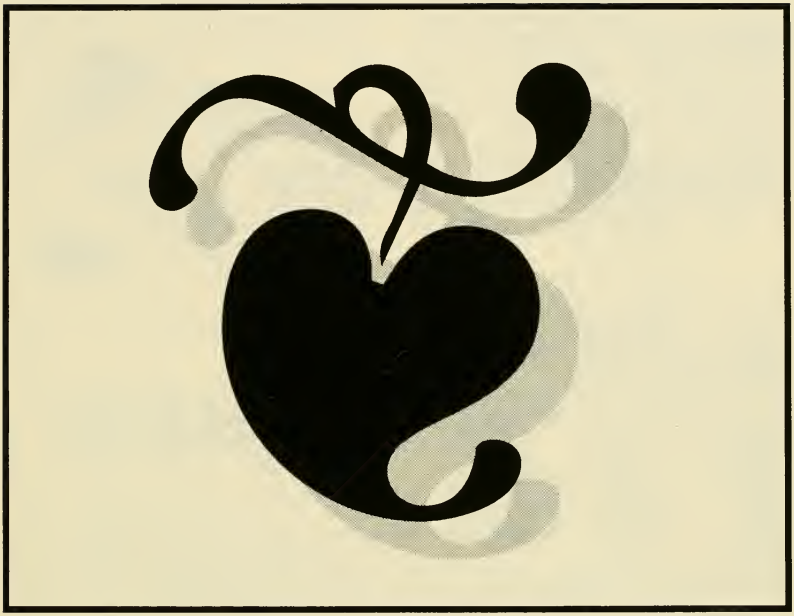

YOUR LOGO

Steps To Creating One That Works!

Tina Sawtelle

WHY BOTHER WITH A LOGO?

Without question...invest in a logo for your business or organization. A logo is your identifying symbol. Your logo says everything about who you are in a nutshell. Your logo tells your business name, what business you're in, and the quality you want to portray. For most, it is one of the first impressions of your business. And how important can that be to winning and keeping customers?!

When creating and using your logo, you are striving for **recognition.** When customers and potential customers see your logo in advertisements, on direct mail pieces, on coupons, on signs, on carry-out trays, on bags and tags, you want them to know in an instant that it is you. You want them to recognize you quickly by your logo. The repetitive use of your logo familiarizes customers with who you are.

SHOULD I DESIGN MY LOGO IN-HOUSE?

Personal Computers and Desktop Publishing have tremendous in-house capabilities. If you have the top quality equipment and expertise, you may be able to design and produce your own logo. For most, it is well worth the investment to work with a professional graphic designer to work up your business logo. Your logo is an investment. You will use it over and over and over again for years to

come. Keep this in mind when you are determining the cost of your logo. You may need to spend anywhere from $150 to $750 to produce a logo that says what you want it to say about your business. Your logo is an investment with lasting value.

You must be 100% involved with the designer in the production of your logo. Provide the designer with as much information as possible to aid in the design. Give your designer pictures of your business. Better yet, invite them out to tour your operation so they have a firsthand experience of what your business is. List five things about your business you want people to know. What do you want to be known for? Choose a type style you like to give the designer an idea of the image you are looking for. It is a mistake to approach a designer and turn them loose to design without giving guidelines. You will turn many things down, make many changes, and pay $$ for it. Be involved!

USE YOUR LOGO EVERYWHERE

Once you've completed your logo, use it! Use it everywhere! You want recognition! There are economical ways of putting your logo on everything. Printing is expensive. Perhaps you ease into printing your logo on all your marketing materials. In the meantime, make use of stickers, rubber stamps (there are some excellent quality ones!), and other means of getting your logo (your name) out there. ❧

Tina Sawtelle, principal of Sawtelle Marketing Associates (Lee Hook Road, Newmarket, NH 03857), consults with agricultural and small businesses on marketing and management. She also teaches agricultural business management techniques at the UNH Thompson School. For more information, call her at (603) 659-8106.

TIPS TO DESIGNING A GOOD ONE!

You want your logo to be easily recognized at a glance (while skimming through the newspaper, sorting through the mail, or driving by at 60 miles per hour).

- **Keep it simple!**
  A logo is not the place for detail of words or illustrations. Simple is better.
- **It must be readable!**
  Can you read the logo without squinting? Choose a typeface that is very easy to read.
- **Neat and compact!**
  Your logo should not take up your whole ad. Keep this in mind when designing. Your logo is saying "My name is..." and you only want to take up a small space saying that. If designed properly, you can come across loud and clear in a small space.
- **Enclose it in a border!**
  Borders are great on all marketing materials. They complete the product and make it stand out. By enclosing your logo, you set it apart from the rest of the piece. You have a much better chance of your logo being reproduced properly if it is enclosed as a unit. Often it aids in the haste of newspaper layout.
- **Include a slogan!**
  A slogan can be part of your logo. Your slogan is another tool to defining who you are.
- **Use the right illustration!**
  Be sure the illustration in your logo makes sense. Does it give the impression you want to give? You don't want to reinvent the wheel of industry logos. Be different. But be sure it is clear what business you're in.
- **Be different!**
  Design something that sets you apart from the rest. But, once again, be sure it is clear what businessyou're in.
- **Ease of reproduction is important!**
  Make sure the logo is easily reproduced. Keep in mind the places you will be using your logo. Newspapers have poor quality of reproduction. They lose detail and they smudge. Tags may need a very small logo. Can you read your logo in all sizes? You will want to copy your logo on a simple copy machine. Does it reproduce well?
- **Designing with color.**
  If your logo is designed with colors (you're fortunate), be sure it is as effective in black and white.

new england anemones

The three houses set into an Epsom hillside give no indication of what's inside. The long benches of unexpected color are not part of some arbitrary Shangri-La, but a tightly-controlled crop grown for commercial cut-flower production.

The first anemones were planted eleven years ago, after Gary and Sabrina Matteson moved here from Rhinebeck, New York. In Rhinebeck, Gary had worked for Riverside Flowers, a range specializing in cut anemones. When the brothers who ran it retired, Gary had the opportunity to rent the place for a year, but when he looked at the upgrading he wanted to do (the old glass houses had lots of leaks—a real problem for quality production) and the fact that anemones are a fourteen-month crop, he decided it would be simpler to start his own operation.

Epsom was chosen because the land was affordable and within seventy miles of a major flower market.

Gary and Sabrina understood that in order to make a living, they would have to keep down costs. They calculated the size range they could manage without full-time help, then built the whole thing. This is the size it will stay.

Their land is hilly, but they've used this to their advantage. They pushed the high south side of the slope along the road to the north. The topsoil was stock-piled for use in the beds; the subsoil was used to create a surface large enough on which to fit three 28x144 houses. This surface was built up slightly toward the north, so that the houses are built on an incline, the most southerly lowest. (This prevents one greenhouse from casting a shadow on the next.) The prevailing wind is from the northwest and the fans are on the east ends—the wind's leeward side—to work with the wind, not against it.

precision creates the environment

The connecting headhouse/work area on the east end is set into the hillside below the level of the production houses. Because anemones like it cool, a windowless work area set into earth is a better place to sort and prepare the cut flowers for market. And it doesn't obstruct any sunlight from the growing plants.

The three houses are used for growing. Nothing else. Each contains five raised beds (three center beds 5 1/2' wide; two side beds 2 1/2' wide) 136 feet long. The two-foot wide walks between the benches are poured concrete and are used as footings for the beds' 2 1/2'-high cement retaining walls. The walkways are the only part of the floor that's covered, allowing the growing media to be much deeper than the bed height suggests. The media is actually five feet deep: four feet of sand topped by a foot of topsoil mixed with manure and peat moss.

Growing space is so important that, in order to create as much as possible, the furnaces (oil) are in a separate room in the headhouse area and heat is brought up through ducts. The duct openings are near the fan jets—which help move the heat quickly.

"Seeking insurance through redundancy," there are two water systems from two separate wells. One using 3/4" line is used for drip feed in the beds and pesticide spraying. A second, using 1 1/4" line, can be hooked into at spigots along the three aisles. Fertilizer and chemicals can be delivered through each system from a 2000-gallon milk bulk tank down in the headhouse area or through a fertilizer injector system. Placing the tank below the production house level allows whatever's being applied to drain from the greenhouse back into the tank for reuse.

But there is a fourth, smaller (25x52), house on another hillside nearby. Also oil-heated and with raised beds, this house is so important it has two separate

(both propane) back-up heating systems. Here, from November through mid-February, plants are grown to produce seed for the next year's crop. "It's hard for other growers to realize how self-contained we are," Gary notes. "If we don't produce seed, we don't have a crop." In this house, Gary also does hybridizing. The natural colors of anemones are primary—red, blue, white...and his crosses aim toward pastels—peach, rose, white touched with light lavender. Seed from promising individual blossoms are tried in the production houses. Right now thirty trials are in progress.

The fourteen-month crop cycle begins in the small house in the spring, when the plants are pulled out and seed they've been producing since November is sown.

In the three main houses, plants are pulled out in June. Fresh peat moss and manure, along with lime and triple phosphate, is added to the top layer of media and rototilled in.

Each bed is sanitized by using methyl bromide applied under plastic that seals it off from the rest of the house. After letting the methyl bromide work for two days, Gary — wearing an airpac borrowed from the local fire department—pulls back the plastic.

The house then airs out for ten days. Then the media is wet down, leaching out remaining fertilizer residue. AquaGro, a wetting agent, is added to the water and Gary feels that by using it, the media's more thoroughly moistened and less compacted.

Six people can plant one house in two days. Two people dig seedlings in the propagation house and bring them in bunches wrapped in wet newspaper to the production house; two people drop the plants at appropriate intervals (the planting pattern is set up beforehand using a multiple dibble); Gary and Sabrina plant.

After the seedlings are watered in, two Agritech foggers—one at the inlet end, one in the middle—are turned on in each house; the moisture is sucked forward by the fan at the exhaust end. They each use forty gallons of water an hour and are operated through August. These foggers also work as a cooling device and can maintain a temperature up to 15 degrees below that outside.

Economics require a lot of flowers per square foot: the beds are tightly planted—which creates an interesting problem: the ideal conditions for botrytis are the conditions anemones like best. Humidity's important and thick bottom foliage is needed to protect the developing buds from sunlight, thus allowing them to mature to their full size.

Standard fungicides are applied, either using a backpack sprayer or through one of the water systems. The only insect problem is spider mites: Temik used to take care of them; Gary now uses Avid.

By September, blossoming starts, although in warm weather, it may not be of particularly high quality. The real production season begins in October and lasts through May.

Day length is not a concern, but light intensity is. Too much light can distort or create a short stem by causing a bud to mature too quickly. So on bright days of intense sunlight, a 60% mesh shade cloth fastened to high-tensile fencing wire strung above the benches is pulled. It's pulled by hand and stays over the crop through mid-day.

Anemones open in sunlight—they are cut in low light because a closed flower is less easily hurt. In spring, this may mean getting up at 3:30.

On a good day, there may be 4000 blossoms to harvest—about six hours work. Using a knife that fits in the palm of the hand, they cut for three hours, have breakfast, then finish up by noon. They cut every other day. During a season, a good plant will produce ten blossoms.

The blossoms are sorted into five categories according to stem length—the longer lengths being the more valuable. (Thicker stems are better as well—they have more water retention capacity—anemones like water.)

After that, Gary and Sabrina look at the blossoms and cull any that are too small, too mature, or that have any blemish or distortion—"Quality is good economics."

The flowers are then graded into four categories and are priced according to grade. Should adverse growing conditions—unexpected hot weather, for example—produce poorer blooms, use of this system assures buyers they will receive the quality they pay for.

The final selections are put into bunches—ten blossoms per bunch, eight bunches per plastic bucket—and stored in a cooler. They're sold to wholesalers in other cities—west to Albany, south to Washington; in order to maintain freshness, Gary and Sabrina will sell no further than a day's trip by bus.

Everything else goes to the Boston Flower Market. Gary doesn't sell; he consigns production to two wholesalers: one deals with "oddball flowers of a very high quality;" the other deals in flowers of a more general nature. The two can cover everything he produces.

Profit is reinvested in labor-saving devices. One investment has been a Priva Zone Maximizer, a computer-operated environmental-control system capable of monitoring four zones. It is used to monitor temperature, sunlight, and humidity in the three flower production houses and the seed production house. The humidity control is particularly crucial because in cooler temperatures, less change is needed to cause increased humidity. (Higher air temperatures have more water absorption capacity.) The system works well because it has what Gary calls 'learning capability'—if it needs to turn on the heat for one minute for every ten to maintain a certain temperature level, then one minute for every nine, then one for every eight, it 'learns' the pattern, and will continue following it to maintain correct levels, without over- or under-heating.

Prior to getting this system, fans were connected to timers—the timers might be set to turn on the fans five minutes for every half hour—but the timers had to be set by hand and changed whenever the situation warranted it. This not only required that someone always be around to keep an eye on things, but it also created extreme fluctuations in humidity levels. The new system creates more even humidity levels and allows Gary and Sabrina to lead more flexible lives. Both things are probably crucial to long-term quality.

Leaving, one turns back and sees a plain stone wall and, beyond it, the neutral plastic houses; beyond these are the clean contours of brown hayed hills. It's good to pause and realize how easy it is to notice only the bright brief product and to miss the steady long-term beauty of the process itself. (B.P.)

Soil Testing as a Management Tool

Tom Buob

Oh no! Not another boring article on soil testing. Maybe yes, and maybe no. Hopefully, this article will inform you as to all the fascinating things going on in the soil-testing world, especially in New Hampshire and New England. As we move towards using more and more "residual waste" products (wood ashes, sludge, compost), environmental monitoring through soil testing takes on increased importance. If we don't use the best procedures and labs, the variability of the results may interfere with any conclusions made.

It's a little known fact that for the last 8 or 9 years a small group has been working on updating and improving the soil testing lab at UNH. We can confidently say that our lab now leads most universities in New England in the accuracy and reliability of soil test results and recommendations. What we've been doing is basically sharpening our soil testing tools, so that they will be more effective and efficient when we use them.

There have been several areas where improvement has been made, some in the lab and some in the field. Although much of the field work has been done in forage crops, some of the information can be transferred (applied) to other crops as well. Finding out how to effectively maintain or improve soil fertility and health, we can make it a better place for all plants.

The major new area has been in use of soil nitrate testing to predict nitrogen fertilizer recommendations. Most of the field work is being done with field corn since corn is a major nitrogen user. However, more is now going on to utilize this test on sweet corn and other vegetables. Unlike some of our other tools, this one cuts two ways. With respect to the environment, it allows us to reduce the risk of water contamination from nitrates. From the profitability standpoint, it allows us to reduce the cost of producing a good crop.

Much of the field work involves the use of periodic soil sampling, both prior to and after fertilizer application. By monitoring nutrient levels throughout the season, we can begin to develop recommendations based on scientific findings. One of the most compounding factors is soil type. Since soil characteristics vary with soil type, we needed to first group soils with similar properties, and then work with soils in each of these groups. Another challenge is to evaluate the soil at various stages of the rotational scheme, since the nutrients (especially Nitrogen) supplied to plants varies with the crop history and sequence. Sound complicated? It's really not, compared to some of the other fertility research going on in New Hampshire, but it does take time to develop information.

An example of this type of field work was demonstrated on five sites this past summer. Farm fields are used rather than the greenhouse so that the results will represent what goes on under natural conditions. Once the sites are identified, soil samples are taken to determine what type and how much of a supplemental fertilizer (other than nitrogen) is needed to grow the crop. After the crop is planted and begins to grow, soil nitrate samples (12-inch core) are taken at various intervals to evaluate the nitrogen supply for the crop. Normally, under production conditions, the nitrogen recommendation is based on a sample taken when the corn plant is between 8 and 12 inches. This has been found to be a good time to evaluate the nitrogen supply which will be available to the plant throughout the season, and also allows sufficient time to apply any additional fertilizer which might be needed. Since the time of maximum uptake of nitrogen is when the corn plant is between 2 feet and tasseling, this also reduces the risk of fertilizer losses to the environment.

In our test plots, we continue to soil nitrate sample throughout the remainder of the season to try to determine the fate of the applied nitrogen. Since there is soil nitrate from the fertilizer as well as from decaying organic matter in the soil, some plots do not receive any fertilizer. In this way we can approximate how much of the nitrogen is coming directly from the soil. At harvest, yields are harvested on all the plots to determine if there is any difference due to the various levels of fertilizer.

In this case, this was the first time that corn was grown in the field for several years. For this reason there was very little increase in yield after 50 pounds of nitrogen was added. This is because nitrogen for the decaying sod was able to supply most of it. Since this was actually a poor sod, extra fertilizer was needed. When a well-fertilized sod is used in rotation with corn, very little, if any, additional fertilizer is needed. Since the soil nitrate test can help us evaluate these nitrogen sources, we can reduce the cost of growing the crop as well as protect the environment from the loss of excess nitrogen.

As we continue to sharpen this tool and use it and others to grow our crops, we can continue to improve production as well as protect our environment. If agriculture is to remain vibrant, this is a necessity. ❧

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BOARD MEETING HIGHLIGHTS

DECEMBER 3
The meeting was at Pleasant View; Andrea, Bob, Bruce, Chris, Henry, Peter, Peter, Richard, and Roger were there.

Richard Emerson will step down as NHPGA representative to the New England Greenhouse Conference; Henry Huntington will take his place.

Two designers—Joni Doherty, JoniDoherty Design Studio, Northwood, and Debbie Ryan of Moriah Design Agency, Shelburne—expressed interest in submitting portfolios in order to be considered for the job of designing a new organization logo.

The Winter Meeting seems pretty much in place. Details—special invitations, awards, responsibilities of various board members—were discussed.

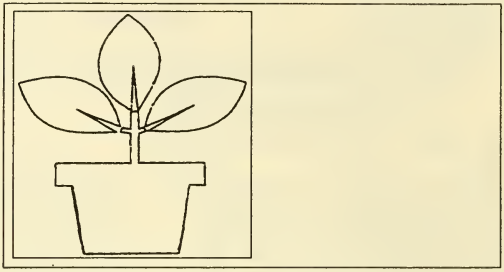
There will be a twilight meeting at Michaud's Nursery and Greenhouses on June 16 at 6:30.

Bob Demers reported on his visit to Eliot Williams Roses in Dover. They would be interested in hosting the Summer Meeting; there's room there for exhibitors, plenty of parking, and shelter if it rains.

The Board decided to have the NHPGA Summer Meeting there on August 18. Perillo's has been asked to handle the meal again.

There would be one speaker with one credit for pesticide recertification later in the afternoon, but a featured speaker could talk on some other topic of interest.

The applications for the NHPGA scholarship were read and this year's recipients were chosen. It was discussed whether or not to expand the pool of applicants by allowing students from other schools and other agriculture-related studies to apply. It was decided to look into it.



It was decided to create a fact sheet to give out at the Farm & Forest Exposition. Next meeting, each Board member will submit the name of a plant he or she recommends for 1993 New Hampshire gardens and a few words about it. These will be combined in a hand-out flier.

JANUARY 7
Andrea, Bob, Henry, and Peter van Berkum met at Pleasant View at seven.

Final arrangements for the Winter Meeting were discussed. Peter Corey will be leaving the Board and a replacement needs to be found to fill his position. It would be appropriate if this person were from the northern or western part of the state.

Peter van Berkum brought a portfolio of an "organization promoter" who is interested in working for the NHPGA. On thing she might do is find corporate sponsors for well-known speakers for various Plant Grower meetings. It was decided to invite her to give a presentation at the February Board meeting.

Bob Demers brought a drawing showing a three-leaved plant in a pot sent him by Rick Simpson of Rolling Green Landscaping and Nursery, Greenland. This design would be used as an official symbol on state directional signs for nurseries, greenhouses and garden centers. The Board approved the design. (It will still have to be approved by the NH Department of Transportation and then by the legislature.)

The Board also decided to write to the EPA commenting on the regulations currently being discussed.

Final plans for plant material for the NHPGA Farm & Forest display and for people to be there to answer questions will be discussed after the Winter Meeting. ❧

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PPGA HIGHLIGHTS

Since the Plant Growers' Association has become a member of the PPGA, it has received a number of fact sheets and brochures. Some of these will be noted in The Plantsman. *For information on others and how to take advantage of offers given, contact Chris Robarge at (603) 862-1074 or Henry Huntington at (603) 435-8361.*

Innovative Horticultural Ideas Winner Announced

Liskey Farms, Inc., of Kalamath Falls, Oregon, was judged 1992 winner of the PPGA's annual 'Innovative Horticultural Ideas Contest.' This contest awards $100 to a unique invention, piece of equipment, or system that makes a grower's job easier and more efficient—but that is not available commercially.

Liskey's entry featured rolling benches manufactured for their sales greenhouse—a "glorified roadside stand that sits on the busiest street corner in town," says Vickie Azcuenaga, the firm's greenhouse manager, who submitted the entry. The only sign is their flowers, so these must be visible from the street. To make them more visible, Liskey's built a bench on a pivot, so it can slant down at a 45-degree angle, showing masses of bedding plants to passers-by. It can also be adjusted to a level position so that the plants can be watered evenly.

They use six of these benches. When Liskey's closes for the night, they are easily rolled into the greenhouse. Each bench holds 18 flats. The benchtop is made from rolled steel mesh with angle irons run horizontally across it to prevent the flats from sliding if a customer chooses a bottom flat when the bench is in the slanted position.

The benches have lightened the workload; last year, plants were hand-carried inside each night. Customers like the display and comment on how attractive the plants look from the street. Designed and built by Tracy Liskey, a member of the family corporation, employees voted this to be easily the company's best improvement this year.

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