

News Edition

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Integrated Pest Management

If you cultivate and grow your plants well, your problems with garden pests will probably be minimal. Sounds pretty simple, doesn't it? Unfortunately, though it's true that a well plant is more resistant to pests and diseases than a sick one, most of us face at least some problems with "critters," those flying, crawling, hopping, leaping fellow-travelers who tend to regard the products of our gardening efforts as yet another opportunity for a free lunch. "Kill on sight," the watchword of the "more is better" school of pest management, no longer seems to be a good solution, as we realize that massive preventive spraying destroys habitats and beneficial animals and insects, as well as causing critical damage to our own environment and to our health. Concern for ourselves and for our environment almost compels us to seek alternatives. With a little information, some common sense, and a willingness to observe and experiment, the principles of Integrated Pest Management can guide us all to safer, saner practices in our own home gardens. And according to professionals such as Theresa Morris of Albermarle Farms in Charlottesville, Virginia, modified IPM systems are quite feasible for home gardeners. Here's how to get started.

What is IPM?

IPM involves caring for your plants in an observant and thoughtful way. By paying careful attention to what's going on in your garden, noting down your observations, and developing a plan for evaluating damage and dealing with unacceptable levels of plant destruction and loss, you can maximize your garden's productivity and good health while you minimize disruptions



Most gardeners struggle with unwelcome visitors such as the harlequin bug.

to the environment that we all share. The emphasis of IPM is on biological, cultural, and physical controls, with minimal reliance on chemicals.

Know Your Pests

The first step in implementing your modified IPM system is to know which pests attack which plants, when they do the most damage, and the life cycle of each pest. IPM is a very specifically targeted system—"You'll need to become keener about observing your plants," according to Morris. "Keep especially accurate records of the time of appearance each year of insects—you'll probably be surprised at how similar the timing of each species' appearance is each year. Sometimes they appear on the scene on almost the same day, and almost always within a week or ten days."

Sound time-consuming? Supplement your own observations by talking with other gardeners in your area and with local county agricultural extension agents, and perhaps by making a trip to the library and by reading extension publications. Troublesome pests might include insects, rodents, deer, or birds.

When to Control

You've identified the culprits, but now what? Careful assessment of both the natural controls (other predators, weather) and the damage that the pest is doing, when weighed against the time, effort, and cost of control, may convince you that you can accept a certain amount of damage to your crop, especially if you are not a commercial grower. "We'll tolerate situations such as a few aphids on the new growth of roses, or a few Japanese beetles," according to Morris.

When the cost of crop loss—in terms of time and energy as well as money—is more than the cost of controlling the pest, you have reached what is called your "economic injury level," the level at which the pest population is causing serious damage. The point is not to start your control measures until you're sure of the amount of damage the pest will cause. On the other hand, don't wait too long—any control system takes a while to implement, and during that time you will suffer additional damage to your crop.

Monitoring pest populations requires careful observation. Check a few sample plants carefully on a regular basis, making sure to check the same plants each time. Some pests will require control measures on a first appearance; others will simply merit watching. This is an area where experience is a very good teacher. ►

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A welcome sight in the garden: predators such as the green lacewing (left) and the ladybird beetle provide natural controls for destructive soft-bodied insects.

Ron West

Cultural Controls

Cultural controls work well for long-term relief. You may time your plantings so that pest life cycles don't coincide with the plant's most susceptible season. You may plant "trap" crops, plants that have such a strong attraction for pests that they'll bypass your vegetables. Or try hand-picking adults, larvae, and eggs as they appear and destroy them by crushing—make sure you know that you're not killing beneficial insects, however! Rotate crops to keep down the population of pests in the soil, and use insect-resistant plants whenever possible. Plant "refuge areas" for pests' natural enemies. Areas of native flowering plants or flowering shrubs are especially good for this. Fabric row covers will prevent insects from laying eggs on plants. And mulching heavily can make it harder for insects to move from plant to plant. Maintain your garden to eliminate plant debris where pests may hide, and cultivate the soil to expose and destroy larvae.

Biological Controls

Bacillus thuringiensis, a bacteria that infects the larval stage, is an effective control for many caterpillars; mix it with an anti-desiccant or with a detergent (Ivory soap, for example) or insecticidal soap to help it adhere to the plant. *Bacillus thuringiensis* 'San Diego', registered for use on the difficult-to-control Colorado potato beetle by the Environmental Protection Agency, will be available next year. Pheromone traps attract insects by simulating the sex hormone of the target insect; a disadvantage of this method is the clustering of large populations of the insect on your property. If you use pheromone traps, spread them out around a good-sized area.

Yellow sticky traps eliminate insects such as whiteflies, thrips, and miners by attracting them and trapping them on a sticky, coated substance. This is an easy trap to construct yourself; one way is to fill yellow plastic margarine containers with heavy oil or another sticky substance. The bacterium *Bacillus popilliae*, called milky spore disease, infects Japanese beetle larvae in the soil. Apply it in spring and fall when the grub population is high; since it needs to parasitize the grubs to remain active in the soil it may have to be reapplied for several seasons before it becomes effective. Talk to your neighbors if you are considering using this method of control; it will probably do little good if it is used on just one small area, since beetles will tend to migrate from adjacent properties.

Natural Predators

Some gardeners introduce natural predators as controls for undesirable insects. "We haven't had particularly good luck with that," says Morris, "but we have noticed that in the natural course of things predators will often appear on the scene when they're needed." Introduced predators are more likely to stick around if refuge plantings are provided for them. Lady beetles (*Hippodamia convergens*) are effective predators for aphids, mites, and other soft-bodied insects; green lacewing (*Chrysopa carnea*) and to a lesser extent brown lacewing (*Hemerobius pacificus*) are also effective controls for soft-bodied insects. Herbs such as fennel, caraway, and dill attract lacewings to the garden. Predatory nematodes attack soil-borne insects and other nematodes, infecting and killing them. Trichogramma wasps (*Trichogramma pretiosum* and *T. minutum*) lay their eggs on host eggs of many pests; the wasps hatch

and feed on the egg, killing it. Aphidius wasps provide another good natural control for aphids.

Dusts and Sprays

Rotenone and pyrethrin are botanical sprays that kill a broad range of insects including aphids, codling moths, cucumber beetles, Japanese beetles, leaf hoppers, and squash vine borers. Rotenone remains active for three to seven days after spraying and kills insects that ingest it; though it has low toxicity to humans and animals it is toxic to honeybees and fish. Pyrethrin is safe for honeybees, humans, and animals, but it quickly degrades under sunlight. It is most effective when sprayed directly on adult forms of the insect. Insecticidal soaps contain fatty acids from plants and animals that have insecticidal properties and are one of the safest insecticides to use. Use for mealy bugs, whiteflies, harlequin bugs, earwigs, and spider mites. Dormant oil, made from fish or petroleum products and sprayed on plants, controls aphids, scale, and mites. Sabadilla, a botanical insecticide that is effective against insects that are more difficult to eradicate—such as squash bugs, harlequin bugs, and blister beetles—is harmful to honeybees, fish, mammals, and humans. Diatomaceous earth kills soft-bodied insects by piercing their bodies, causing dehydration.

Commercial Chemical Pesticides

Despite careful attention to physical, biological, and cultural control measures, you may find that there are some situations that require stronger chemical controls. "We can't seem to combat fungi on our roses with organic control methods," says Morris. And you may have to depend on chemical controls if you have a new garden, since cultural and biological controls take some time to implement. The use of chemical controls is not a badge of failure but a reasonable compromise in certain situations. Just make sure that manufacturers' instructions are followed very carefully. Integrated pest management means just that—an integrated approach which allows for the thoughtful use of chemicals when required.

Animal Pests

You may find that your most destructive pests are not insects, but animals such as deer, gophers, raccoons, or rabbits. Deer can be especially troublesome—and as Gary San Julian of North Carolina State University points out, "If they're really hungry, they'll go through an electric fence to get food." A

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AHS Bulletin Board

1989 Annual Meeting to Focus on Liberty Hyde Bailey

The 1989 American Horticultural Society Annual Meeting, to be held July 26-29 at the downtown Radisson Hotel in Minneapolis-St. Paul, Minnesota, promises to be one of our most informative and exciting meetings ever. We'll be taking a look at the work of the great plantsman Liberty Hyde Bailey in light of his tremendous influence on the world of horticulture, and in this spirit we encourage members who are planning to attend to browse through any of his 65 classic works on gardening. A biography—*Liberty Hyde Bailey* by Philip Dorf, for example—is a good beginning, or skim through the *Manual of Cultivated Plants*, *How Plants Get Their Names*, or *The Cultivated Evergreens*, to name just a few. His carefully-focused books on particular plants such as campanulas make fascinating reading.

Former winners of the American Horticultural Society's prestigious Liberty Hyde Bailey Award will be honored guests at the meeting, which will also feature visits to the University of Minnesota Arboretum and the private gardens at Wayzata and tours of the beautiful city of St. Paul, the Walker sculpture gardens, and the lovely lakes of this region.

The meeting will feature special presentations on prairie restoration, cold-hardiness in plants, and other issues particularly relevant to this region, as well as on other horticultural topics of national importance. Plan now to visit this region in one of its loveliest seasons, and watch your mail for further information on how to register.

Membership Contest in Full Swing

You still have a month left to enter the AHS Membership Contest, which features an exciting trip to the Leeward Islands as the grand prize. Visit such exotic ports of call as Antigua, Montserrat, Nevis, St. Kitts, Saba, St. Barthélemy, and St. Martin as you enjoy the special service only a small cruise ship can offer. Other prizes include a classic

Luytens garden bench generously donated by Paul Hawken of Smith and Hawken (second prize), one certificate for \$100, two certificates for \$50, and four certificates for \$25 (for the first four entries of five or more members) from Andre Viette Farm and Nursery in Fishersville, Virginia. Other prizes include elegant Redouté print sets. If you sponsor even one member, you will receive a Redouté print. Entries must be postmarked by December 1.

AARS Award to Hutton



AHS Board of Directors member R.J. Hutton (right), chairman of the Conard-Pyle Company and introducer of the new miniature rose, 'Debut', was honored at the All-America Rose Selections' meeting this summer in Anaheim, California. The nonprofit organization of rose producers and introducers tests new rose varieties to determine those which are exceptional. The award was presented by his son, AARS president Steven B. Hutton.

Christmas Flower Show at 1988 Open House

The always-popular American Horticultural Society Christmas Open House will be held December 10 at the American Horticultural Society's headquarters, located at 7931 East Boulevard Drive off the George Washington Memorial Parkway south of Alexandria, Virginia. This year the Open House will feature a spectacular Christmas flower show sponsored by District 2 of the National Capital Federation of Garden Clubs. Plan to attend this festive event, and enjoy holiday punch, Christmas crafts, and an opportunity to purchase magnificent trees, poinsettias, and holiday greens, including classic greens from our own River Farm property. Watch your mail for further information.

Discover the Native American Yellowwood

Cladrastis lutea (formerly *Virgilia lutea*), a spectacular but very much underused American native, is a choice worth considering for gardeners looking for an outstanding shade tree especially suitable for small properties. Topping out at about 35 feet (though one specimen in Pennsylvania has reached a height of about 60 feet), the American yellowwood sports beautiful bright green foliage, presenting a tremendous contrast to the generally darker and more subdued greens in most landscapes. The tree also puts on a spectacular late-spring display of beautiful wisteria-like white chains of bloom that drip from the branches. Its smooth gray bark is reminiscent of beech bark. The very soft, rounded crown produces a spread that is generally wider than the height of the tree, which tends to be multi-stemmed, carrying as many as four or five leaders.

The yellowwood was discovered by a French botanist on the banks of the Cumberland River in Tennessee and is indigenous to very few areas of the United States, primarily areas along the Cumberland River, with a few rather sparse stands in Arkansas, southern Kentucky, and southern Mississippi. Because many rivers



Tony Halterlein

The lovely drooping racemes of *Cladrastis lutea* create a stunning late-spring display, appearing when many other spring-blooming plants have retired for the season.

in its native habitat have been dammed, the tree has been flooded out in many areas, causing it to be placed on the Environmental Protection Agency's Endangered Species List. However, the plant has a very wide range of adaptability and has been found to thrive from Maine to Minnesota to Alabama, with an effective range from USDA Zone 3 to Zone 8. This is a very adaptable plant with no unusual cultural requirements that makes few demands, tolerating both acid and alkaline soils.

The yellowwood does need some protection from high winds and should not be planted

in an exposed site that is subject to windy conditions; though it is not weak-wooded like the silver maple, its outer twigs tend to be brittle. The tree is not prone to breaking limbs. A medium grower, it puts on about one foot a year.

Though you won't commonly find the American yellowwood in retail garden outlets, it is widely available in the wholesale trade; good nurseries all over the country either have it or can obtain it on request. Ask for it—the American yellowwood is among the many desirable but lesser-known plants that will repay your persistence many times over.

Burle Marx Receives AHS National Achievement Award

The following is the text of the presentation made by Mrs. Carolyn Marsh Lindsay, President of the American Horticultural Society, to Roberto Burle Marx on the occasion of his receiving the AHS National Achievement Award, September 13, 1988:

Roberto Burle Marx—Ambassador of beauty and joy, musician, artist, architect, landscape architect, botanist, and naturalist:

Through your multifaceted career and multiplicity of international achievements, you have earned our deep admiration for all you have contributed during your lifetime. Your honors are legion.

On behalf of the Board of Directors and the 22,000 members of the American Horticultural Society, it is my great privilege to present you, Roberto, with our National Achievement Award, reserved to acknowledge only the most extraordinary achievements and devotion to a more beautiful world.

Preparing a Wildflower Meadow for Winter

Though a wildflower meadow will usually winter over with minimal preparation—"You could just leave it as is," according to Louis Culp of the Morris Arboretum in Chestnut Hill, Pennsylvania—Andre Viette of Andre Viette Farm and Nursery in Fishersville, Virginia, suggests that you might want to go over the meadow with a rotary mower or even a harrow to make sure the seed makes good contact with the soil, giving seeds just a light covering of not more than ½ inch of soil. "Of course, if the soil contains more noxious weeds than wildflowers, this treatment will just compound the problem," according to Viette. "If the meadow has been well maintained, a light soil covering will help seeds become established."

A meadow that is allowed to stand over the winter will provide cover and food sources for wildlife, according to Culp, though if you are concerned about garden

pests, they may find the additional cover attractive, too! Both Viette and Culp recommend against fertilizing meadows on a yearly basis. "They don't need it, and fertilizer may cause grasses to crowd out the wildflowers," according to Culp.

American Horticultural Society curator Tony Halterlein reemphasizes the importance of the proper choice of materials in the establishment of wildflower meadows. "If you prepare your site properly and carefully choose plants that can compete well with invasive weeds in your area, you won't have to do that much maintenance once the meadow is established. Talk with experienced wildflower gardeners in your area, and find out which plants have worked for them. It's not easy, but proper preparation is especially important with wildflower meadows; with careful planning and foresight, a beautiful meadow is an attainable goal for any gardener."

Gardener's Bookshelf



Home Landscaping

Written by landscape and garden experts Elizabeth Murray and Derek Fell, this useful and accessible design book provides a wealth of information and ideas for creating lavish and functional outdoor spaces. The first five chapters focus on particular functions and activities—"Entertaining and Recreation," "Display Gardens," while the final four chapters cover aesthetics—the optical tricks and visual conventions of landscape design. By Elizabeth Murray and Derek Fell. Simon and Schuster, New York, NY 10023. Publisher's price: \$29.95; AHS member price: \$23.95.

Garden Accents

Billed as the "complete guide to special features for creative landscaping," this elegant, lavishly illustrated book is devoted to the enormous array of ornaments and accents that are available to add style and individuality to the garden. Derek Fell illustrates the basics of various garden styles and the features, plants, flowers, and essential details that give each style its special character. These hints are extensive enough to enable you to design a garden from scratch, though they also provide useful tips for the gardener who's searching for that one perfect "final touch." By Derek Fell. Henry Holt, New York, NY 10075. Publisher's price: \$27.95; AHS member price, \$24.45.

Landscape It Yourself

The prospect of designing a landscape often shakes the confidence of even the fairly



experienced gardener. This very useful book aims to restore some of that confidence, packing a wealth of information into fourteen chapters that start with defining your space ("Landscape Design: A Primer"), move through various design situations (high-rise apartments, subdivision houses), and end up with specialized chapters on pools and greenhouses. The author is generous with his experience and advice while encouraging the reader to explore and develop a personal style. The book is illustrated with black-and-white drawings, diagrams, and photos. By Jamie Gibbs. Harper and Row, New York, NY 10022. Publisher's price: hardcover, \$24.00, softcover, \$14.95. AHS member price: hardcover, \$18.50; softcover, \$11.50.

Insect-Eating Plants and How to Grow Them

There are fifteen recognized genera of carnivorous plants, divided into over 500 species. Adrian Slack describes over 200 of these, including almost all those known to be in cultivation. Plants described include the sundews, trumpet pitchers, cobra lilies, South American sun pitchers, bladder worts, and of course the best-known carnivorous plant, the Venus fly trap. The many color illustrations demonstrate the attractiveness as well as the interest of carnivorous plants; the text, written for the amateur, contains information that nurseries and botanical gardens will also find valuable. By Adrian Slack. University of Washington Press, Seattle, WA 98145. Publisher's price: \$19.95. AHS member price: \$17.95.

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Gardener's Q&A

Chances are that if you have a question about gardening, someone else has run up against the same problem. This column is designed as a forum for discussion of gardening questions and solutions that work.

Q: Our Japanese irises have spread all over and will have to be moved to give them more space. How should we do this, what is the proper time, and are there any precautions?

—R.M., Frederick, Maryland

A: The Japanese iris, *Iris kaempferi*, prefers full sun, abundant moisture, and lime-free soil with lots of humus. They should be dug up and transplanted in the summer after they have flowered. This will enable them to establish roots and gather nutrients for the following year.

To transplant, dig them up in the summer and discard any old or decaying rhizomes, roots, and leaves. Shorten the leaf blades to about four to six inches, cut back the roots to two to three inches. Create trenches in the soil and place the rhizomes on the ridges with their roots saddling the top of the ridge. Cover with soil but keep the rhizomes at ground level. Water thoroughly.

Q: What will keep Japanese beetles from eating rose flowers?

—M.S., Waldwick, New Jersey

A: Japanese beetles are interested in nearly every plant in your garden, not just roses. They are known to feed on more than 200 species of plants. The immature form of the insect is a grub which feeds on the roots of the grass in your lawn. They are almost impossible to eradicate, but by controlling their population you can limit the damage they do. Some ways to do this are 1) hand picking the beetles off the plants and dropping them into a container of soapy water or rubbing alcohol; 2) using traps such as Bag-a-Bug. One drawback to this method is that the traps will attract the insects from a large area, including your neighbor's yard, and you could possibly end



Iris kaempferi should not be moved until after they have flowered.

Laura E. Coit

up with more beetles than you started with; 3) applying milky spore disease such as Grub Attack. This is produced by a bacterium called *Bacillus popilliae* and it infects the grubs in your soil. It remains active for a long time once established, although it does require two to three years to reach peak effectiveness and if your property is small it offers no protection from neighboring Japanese beetles, which may prefer your roses to what is available in your neighbor's garden.

Q: Last year we had miniature roses which spent the summer outside, and in October we brought them inside. They were in a north-facing window, 45° F to 55° F, and were watered occasionally. They seemed to do okay, but then the leaves dried up and they have never revived. Do you have any suggestions?

—E.K., Cape Elizabeth, Maine

A: Caring for your miniature roses indoors in the winter is basically the same as caring for them outdoors in the summer. In fact, you should try to simulate summer conditions by giving the roses full sun (southern exposure) and temperatures of 70° F in the daytime and 60° F at night. The humidity must be as high as it was in the summer. This can be obtained from daily misting and by placing the roses on top of a shallow tray filled with gravel and water. Miniature roses should still receive the same amount of fertilizer and water

that you were applying in the summer. Remember that plants do have to adapt to new situations and a few leaves may drop when you bring them in, but you should also get new growth later when the plants stabilize.

Q: I have a particularly beautiful Japanese hemlock. I would like to propagate it from cuttings. Can you advise me on the method/technique?

—V.W., Bethesda, Maryland

A: Propagating the Japanese hemlock, *Tsuga diversifolia*, from stem cuttings is more difficult than seed propagation; however, there is one method for you to try. The timing is critical and you must use a rooting hormone which you can purchase from a local nursery.

1. Fill a pot with cuttings compost.
2. Take the cuttings in the autumn or winter and take them from the top rather than the bottom of the plant. Choose vigorous shoots with distinct growing points.
3. Make a clean cut about ¼ inch into the brown-barked wood of the cutting so that the cutting is predominantly green but has a small hardwood base.
4. Trim the leaves off the bottom inch of the cutting. Dip the basal cut in the rooting hormone.
5. Insert the cutting into a one inch hole in the compost and firmly pat in. Plant other cuttings two inches apart.
6. Label the containers; water with a mister; and place the pots in a closed container.
7. The cuttings should root within three to four months. Harden off and pot in the spring.

Ginkgo Earliest Species of Tree

The earliest species of tree still surviving is the maidenhair tree (*Ginkgo biloba*) of Chekiang, China, which first appeared about 160 million years ago during the Jurassic era. It was "rediscovered" in 1690 and reached England about 1754. It has been grown in Japan since 1100, where it was known as *ginkyo* (silver apricot) and is now called *icho*.

Our Members Tell Us . . .

In our last issue, we asked members to pass along experience and hints in response to the following question: **Do you have an approach to pest and slug control that has worked well for you?** Here are some member suggestions:

I sprinkle whole corn feed around my rose bed, and the crows, bluejays, pigeons, etc. come and feast. Then the smaller birds feast on their crumbs. Birds of all sizes also feast on Japanese beetles! This year, they did a great job of keeping my roses largely unmolested by those pesky beetles and other bugs.

—Edith Teilhaber
Spring Valley, New York

I have been very successful in combating slugs with diatomaceous earth. The brand I use is Witco Diatomite, produced by Witco Chemical Company, 277 Park Avenue, New York, NY 10017. I buy it from a swimming pool supplier.

—Helen C. Barber
Cambridge, Maryland

I keep a file of slug remedies, and as slug damage is constant in almost all regions, gardeners keep thinking up new ways to right it. I found a tip that worked this year for me using horseradish leaves. I had noticed that there were slugs eating the horseradish even when the weather was driest, and of course, horseradish plants are so huge that you can always spare half a dozen long coarse leaves.

I now cut the leaves, placing them on the earth behind ornamental plants where slug damage has begun to be noticeable—near hostas, for example. Even though the horseradish leaves wilt quickly, the slugs feast on them for several days. When they are all yellow, I put fresh leaves on top. I am guessing, but if you don't have horseradish, perhaps other members of the cabbage family would work. You could try broccoli leaves, plain radishes, cabbage, or cauliflower.

—Connie Fitz
Woodstock, Vermont

Our question for the next issue: **How do you keep predators out of the garden during the winter?** Please share your experience with other members by sending a note to: Editor, *American Horticulturist* News Edition, 7931 East Boulevard Drive, Alexandria, VA 22308.

The New AHS Calendar Perfect for Gifts and for Yourself!



Perennials fulfill our craving for color and bloom throughout the gardening seasons, and here are your favorites in brilliant color month after month, accompanied by pointers on growing and suggestions for companion plantings. A year-long visual pleasure, with room for notes and with all important dates, holidays, and American Horticultural Society events noted for your reference.

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Gardener's Dateline

► **November 1-27. Annual Chrysanthemum Display.** Brookside Gardens Conservatories, Wheaton, Maryland. Information: Brookside Gardens, 1500 Glenallen Avenue, Wheaton, MD 20902, (301) 949-8231.

► **November 12. Fall Walk.** Scott Arboretum, Swarthmore, Pennsylvania. Information: Scott Arboretum, Swarthmore College, Swarthmore, PA 19081, (215) 328-8025.

► **November 5-6. African Violet Show.** Atlanta Botanical Garden, Piedmont Park at the Prado, Atlanta, Georgia. Information: Atlanta Botanical Garden, Piedmont Park at the Prado, Box 77246, Atlanta, GA 30357, (404) 876-5858.

► **November 5-6. Ikebana Show.** Descanso Gardens, La Canada Flintridge, California. Information: Descanso Gardens, 1418 Descanso Dr., La Canada Flintridge, CA 91011, (818) 790-5571.

► **November 5-6. Landscape Irrigation Contractors Short Course.** Bally's Resort Hotel, Las Vegas, Nevada. Information: Deborah Grosso, The Irrigation Association, 1911 North Fort Myer Drive, Suite 1009, Arlington, VA 22209, (703) 524-1200.

► **November 5-20. The Mum Show.** Gage Park Greenhouses, Hamilton, Ontario, Canada. Information: Parks Division, Dept. of Public Works, City Hall, 71 Main St. E., Hamilton, Ontario, L8N 3T4.

► **November 6-9. International Irrigation Exposition and Conference.** Bally's Resort Hotel, Las Vegas, Nevada. Information: Irrigation Association, 1911 North Fort Myer Drive, Suite 1009, Arlington, VA 22209, (703) 524-1200.

► **November 7-10. Professional Lawn Care Association of America Annual Conference and Trade Show.** Superdome, New Orleans,



The wassail bowl will again be overflowing at the American Horticultural Society's Christmas Open House, to be held this year on December 10 from 11 a.m. to 4 p.m. at the Society's River Farm headquarters, 7931 East Boulevard Drive, Alexandria, Virginia. For more information call (703) 768-5700.

Louisiana. Information: Professional Lawn Care Association of America, 1225 Johnson Ferry Rd., N.E., B-220. Marietta, GA 30068, (404) 977-5222.

► **November 7-December 5. Intensive Pruning Workshop.** Room 2760, Boelter Hall, UCLA Extension, Los Angeles, California. Information: UCLA Extension Division of Science, P.O. Box 24901, Los Angeles, CA 90024, (213) 825-7093.

► **November 9-11. Plant Propagation and Tissue Culture.** Donaldson Brown Center for Continuing Education, Virginia Tech, Blacksburg, Virginia. Information: Paul Smeal, Virginia Tech, Blacksburg, VA 24061, (703) 961-5182.

► **November 10, 11, 12, and 17. Japanese Garden Design Symposium.** New York Botanical Garden, Bronx, New York. Information: The New York Botanical Garden, Education Department, Bronx, NY 10458-5126, (212) 220-8720.

► **November 19-20. Bonsai Show.** Los Angeles State and County Arboretum, 301 N. Baldwin Avenue, Arcadia, California. Information: Los Angeles State and County Arboretum, 301 N. Baldwin Ave., Arcadia, CA 91006-2697, (818) 446-8251.

► **November 14-18. Conference: Natural Resources for the 21st Century.** Twin Bridges Marriott Hotel, Washington, DC. Information: The American Forestry Association, P.O. Box 2000, Washington, DC 20013, (202) 667-3300.

► **November 16. Lecture: The Gardens of the Rockefeller Center.** The Horticultural Society of New York, 128 West 58th Street, New York, NY. Information: The Horticultural Society of New York, 128 West 58th St., New York, NY 10019, (212) 757-0915.

► **November 17-18. Zonal Geranium Tour/School.** Avalon Inn, Warren, Ohio. Information:

Ohio Florists' Association, Suite 230, 700 Ackerman Rd., Columbus, OH 43202, (614) 267-1117.

► **November 17. Japanese Garden Design.** Chicago Botanic Garden, Glencoe, Illinois. Information: Chicago Botanic Garden, Education Department, P.O. Box 400, Glencoe, IL 60022.

► **November 19. Fall Rose Care.** The Arnold Arboretum of Harvard University, Jamaica Plain, Massachusetts. Information: Sandra Pallett, Education Registrar, The Arnold Arboretum, Arborway, Jamaica Plain, MA 02130.

► **November 18-20. Green Team Conference and Trade Show.** Buena Vista Palace, Lake Buena Vista, Florida. Information: Professional Grounds Management Society, 12 Galloway Avenue, Suite 1E, Cockeysville, MD 21030, (301) 667-1833.

► **November 20. Workshop: Pinecone and Succulent Wreaths.** Information: South Coast Botanic Garden Foundation, Inc., 26300 Crenshaw Blvd., Palos Verdes Peninsula, CA 90274, (213) 544-1948.

► **November 29. Holiday Arrangements.** U.S. National Arboretum, 3501 New York Avenue, N.E., Washington, DC. Information: U.S. National Arboretum, 3501 New York Ave., N.E., Washington, DC 20002, (202) 475-4857.

► **December 3-4. Camellia Show.** Los Angeles State and County Arboretum, 301 N. Baldwin Avenue, Arcadia, California. Information: Los Angeles State and County Arboretum, 301 N. Baldwin Ave., Arcadia, CA 91006-2697, (818) 446-8251.

► **December 10. Holly Festival.** The Scott Arboretum at Swarthmore College, Swarthmore, Pennsylvania. Information: Don Craig, The Scott Arboretum, Swarthmore College, Swarthmore, PA 19081, (215) 328-8025.

Day Butterfly Center Opens

The largest glass-enclosed butterfly conservatory in North America, located on a four-and-a-half acre site at Callaway Gardens in Pine Mountain, Georgia, officially opened on September 25, 1988. The center features 50 species of free-flying butterflies from Central and South America, Malaysia, and Taiwan inside the conservatory, and 65 species outside in the surrounding one-and-a-half-acre native butterfly garden, which is nestled in the 45-acre Meadowlark Gardens. The center was named in honor of Cecil B. Day, Sr., founder of Days Inns of America, Inc.

National Pesticide Hotline Established with Toll-Free Access

The Texas Tech University Health Sciences Center, Lubbock, has established the National Pesticide Telecommunications Network (NPTN) to provide a variety of impartial information about pesticides. Toll-free access to the network is available from the contiguous United States, Puerto Rico and the Virgin Islands.

Under the auspices of the Department of Preventive Medicine and Community Health, the network operates 24 hours a day, 365 days a year. The program is designed to provide accurate and prompt responses to requests from the medical and veterinary professional communities and the general public. Requests for information may include such concerns as pesticide product information; information on recognition and management of pesticide poisonings; toxicology and symptomatic reviews; referrals for laboratory analysis; investigation of pesticide incidents; emergency treatment information; safety information; health and environmental effects; and clean-up and disposal procedures.

The key NPTN telephone personnel are pesticide specialists with agricultural, environmental, and public health backgrounds. Inquiries also are answered by additional operators trained to provide and interpret information for callers. These operators are graduate students in the fields of biology, anatomy, biochemistry, and entomology.

NPTN operators are trained and prepared to deal with emergency situations. All pertinent information is recorded by the operator, and sources are checked to enable the operator to deliver concise, accurate information. Questions calling for more expertise can be referred through a telephone switching system to poison control centers under retainer to NPTN.

The telephone hotline service is informational only, and has no enforcement capability or responsibility. However, reports which may assist in formulating regulatory policies are periodically forwarded to the U.S. Environmental Protection Agency.

The National Pesticide Telecommunications network number is: 1 (800) 858 PEST.

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Plants Wanted

Members who are growing or who have access to any of the plants or seeds listed below are invited to help fellow members locate seeds, plants, or cuttings. Those who can provide such information should write directly to the persons listed below.

► *Aconitum henryi*, (Monkshood). Previously, *A. autumnale*. Perennial, 3 to 6 feet tall with tuberous roots. Leaves are 2 to 6 inches, mostly 3-parted, almost to base. Flowers mostly deep blue-purple, 1½ inches high with a ¾-inch helmet. Poisonous roots and leaves. Native to China. Robert Bourne, 54 Powell St., Brookline, MA 02146.

► *Anemone x hybrida* 'Elegantissima'. Perennial with divided or compound leaves. Solitary flowers, showy sepals, absent petals. Fruit is an achene. Robert Bourne, 54 Powell St., Brookline, MA 02146.

► *Artocarpus heterophyllus*, (Jackfruit). Tropical tree, up to 50 feet tall, with leaves up to 8 inches long, elliptic to obovate, stiff and glossy. Flowers borne on trunks. Male flowers in stiff spikes and female in heads. Used for fruit as well as timber. Wynne F. Miller, ISOLAB, Inc., Drawer 4350, Akron, OH 44321.

► *Canna iridiflora*. Tall, erect perennial up to 10 feet high. Green foliage and stems. Leaves up to 4 feet long, and 1½ feet wide. Large, rose-colored flowers with a corolla tube up to 2½ inches long. Native to Peru. William Drysdale, 4300 Isabella, Riverside, CA 92501.

► *Chrysanthemum serotinum*, (high or giant daisy). Previously named *C. uliginosum* or *Pyrethrum uliginosum*. An erect, bushy perennial, 4 to 7 feet tall. Leaves long-lanceolate, 4 inches long, sharply and coarsely toothed. Flowers up to 3 inches across, disc flowers are yellow, ray flowers are white. Native to Central Europe. Robert Bourne, 54 Powell St., Brookline, MA 02146.

► *Clerodendrum myricoides*. A shrub



Aconitum henryi

Laura E. Coit

native to Africa, up to 10 feet tall. Leaves slightly hairy, ovate; young leaves pinkish-brown. Corolla is blue. Also *C. c.f. wildii*: velvety reddish mauve stems with blue corolla; *C. quadrangulatum*: oval green leaves with slight pungent odor, blue/white corolla; *C. rotundifolium*: white fragrant flowers. Leonard H. Corbett-Grant, 2145 First Ave., Napa, CA 94558.

► *Clusia rosea* 'Variegata'. A subtropical tree with pink and white globose flowers; leaves of this cultivar are variegated with pale yellow. David Thomas, 6126 Hadley, Merriam, KS 66202.

► *Colutea x media* (bladder senna). A small tree or shrub grown in mild climates,

flowers orange or reddish-yellow (syn. *C. x orientalis*). Samuel Tete, 99 Hillside Park Drive, New Hyde Park, NY 11040.

► *Cornus alternifolia* 'Argentea', (variegated pagoda dogwood). Deciduous tree with horizontal branching pattern. Leaves are marked with white variegation, alternate, ovate to elliptic, 5 inches long. Inflorescence of terminal cymes about 2½ inches across. Fruit dark blue, rarely yellow. Al Crist, R.R. 2, State Road 14 East, Silver Lake, IN 46982.

► *Halesia carolina* 'Rosea'. Pink-flowered form of the Carolina silverbell. David Schonke, 2459 Sunrise Court, Green Bay, WI 54302.

► *Mandevilla splendens*, a woody twiner with rose-pink funnel-form flowers, native to southeast Brazil (syn. *Dipladenia splendens*). Cameron Harris, P.O. Box 220748, Charlotte, NC 28222.

► *Menziesia ciliicalyx*, (mock azalea). Deciduous shrub, up to 2½ feet tall. Leaves elliptic to obovate, up to 2 inches long. Flowers yellowish-green, tipped with purple, ½ inch long, pubescent stamens. Native to Japan. Also looking for any cultivars of *M. ciliicalyx*. Robin H. Cooper, 2884 Beaver Court, Hubbard, OR 97032.

► *Nyssa aquatica*, (cotton gum or tupelo gum). Deciduous tree up to 100 feet, native to North America. Leaves oblong to ovate, up to 10 inches long. Flowers are minute, greenish-white. Fruits are solitary, 1 inch long, dark purple. R. Stanley Lawton, 7600 Spring Mill Rd., Indianapolis, IN 46260.

► *Passiflora lutea*, (yellow passionflower). Vine with 3-lobed leaves, 1½ to 2½ inches long, round at apex. Flowers are ½ to ¾ inch across. Sepals are a pale greenish yellow; petals are minute and white. Coronas have pink bases and white tops. Fruit is globose-ovoid and less than an inch long. Armin Hummel, Gaishof 13, 7801 Ebringen, Germany.

► *Prunus spinosa* (blackthorn or Irish blackthorn). Deciduous shrub, 3 to 12 feet. Young twigs are pubescent, then turning dark. Leaves are 1 to 1½ inches long, oblong to obovate, pubescent. White flowers before the leaves; blue-black, globose fruits. Wood used for turnery and walking sticks, fruits used for flavoring liqueurs. John P. Clark, 2753 Gulf Rd., Varysburg, NY 14167.

New Research on Mulches

New research indicates that there may be more to mulches than meets the eye. Colored mulches, new versions of inorganic mulches, and biodegradable mulches offer a number of options to the gardener with a yen to experiment.

Mulch can be spread over the soil to accomplish one or more of the following: prevent weeds from sprouting or growing, warm up the soil, insulate plant roots against cold temperatures, hold moisture in the soil, minimize water loss, or prevent soil from encrusting or eroding. A variety of plant materials can be used, including grass clippings, (let the grass decay for a couple of weeks), straw or hay (know the source—the material may contain weed seeds), peanut hulls, partly decomposed bark or wood chips, or even shredded newsprint.

Newer inorganic mulch materials in addition to black plastic (popular for heat-loving crops) include a porous, natural-looking brown plastic mulch, a heavy-duty plastic mulch with precut holes that has the added advantage of being reusable, and a biodegradable paper mulch marketed by W. Atlee Burpee Company under the name Agripaper.

Mulching With Grass

A study by University of Wisconsin/Madison horticulturists Malcolm Dana and Astrid Newhouse using grass as a living mulch for strawberries has produced favorable results, indicating that grass protects the fruit in winter and lowers herbicide use. Hay has traditionally been used as a winter mulch for strawberries, but grass, which grows 12 to 18 inches tall compared to three to four-inch deep hay mulch, offers better protection against wind and snow, according to Dana. And since the ground is covered year-round with 75 percent grass and 25 percent strawberries, there are fewer weeds with less need for herbicides. As a result, there is less chance for chemicals to pollute the crop, soil, and environment. The living mulch plots also show substantially less leaf-scorch disease.

Colored Mulches

USDA plant researchers are discovering that colored mulches can affect plant growth. They have experimented with lengths of fabric and plastic and with straw painted white, yellow, red, and blue, producing dramatic changes in yield, stem growth, rooting, and leaf shape. Though these efforts are largely experimental, home

gardeners may want to try them as well.

Experiments have concentrated on mulches that reflect certain wavelengths of light to plants, especially the far-red wavelengths, and most have involved makeshift materials such as colored fabric and straw painted with a spray gun. Results indicate that tomatoes grown on red mulch offer a 20 percent greater yield than those on black plastic, and that bell peppers and potatoes on white mulch outyielded plants on blue, red, or yellow mulch or on light-colored soil. Researchers are not ready to offer any recommendations to home

gardeners, but an experiment with colored mulches would be easy and intriguing and might produce some dramatic results. The four colors that are likely to have an effect are white, black, blue, and red.

As you settle in to plan next year's garden, why not set aside some space in your mind's eye for an experiment with colored mulches, or with one of the other new ideas in mulches? After all, horticulture is an area where interested amateurs have come up with significant and exciting results. Not to mention the biggest tomatoes on the block!



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Contest begins immediately and ends on December 1, 1988—to give you time to pack! If you have not received contest packet, call AHS at 1-800-777-7931.

Integrated Pest Management

continued from page 3

lot does depend on the environmental situation—last summer's drought may have hungry deer ready to raid your fall or winter garden. Joe Maisano, extension agent in horticulture and turf at the Fairfield County Extension Center in Bethel, Connecticut, suggests caging your plants with a six- to eight-foot fence on a sturdy frame with fencing along the top; he also suggests that if repellents are used for deer, they be changed every thirty days or the deer could become accustomed to the repellent and even begin to find it palatable. "There's not much scientific evidence to support this, but one of our gardeners noticed it last year when he ran out of repellent. It's worth considering." Maisano also suggests that gardeners who are troubled with pine mice or other small rodents should pull mulch away from the bases of plants until the ground freezes to eliminate habitats. Jim Brown of the Memphis Botanical Garden notes that parachlorobenzene (moth flakes) seems to repel raccoons. San Julian says that some preliminary data suggest that Zest soap may keep deer away from crops, either scattered around on the ground or hung in trees. Commercial taste-aversion products may also be helpful.

Controlled Intervention

Integrated Pest Management may best be described as an intelligent approach to pest control. It concerns choices, with an emphasis on trying the safe way first. With its reliance on careful observation and restraint, it offers a sane and sensible alternative to thoughtless manipulation of the environment by the overuse of pesticides. It's something we're going to have to give more and more attention to as we realize the full impact of each of our interventions in the environment.

—Kathleen Y. Riley
Editor



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IPM Guide Available

The Institute for Environmental Studies, University of Illinois, (408 South Goodwin Avenue, Urbana, Illinois 61801) has a 45-page illustrated guide to controlling home and garden pests with a minimum of chemicals. Send a check for \$2, payable to the University of Illinois, for the booklet entitled *Integrated Pest Management for the Home and Garden*.

Regional Notes



Gardeners throughout the country have felt the effects of this year's drought. We spoke with professionals in several regions about preparing drought-stressed plants for winter.

► Diana Arndt, horticulturist at the Fort Worth Botanical Garden in Fort Worth, Texas, recommends that gardeners in her area be careful about fertilizing drought-stressed plants. "Stressed plants that put on a spurt of growth are at a disadvantage and may suffer significant dieback, so even if you want to see late-season growth, don't fertilize." She also recommends keeping the soil damp throughout the fall season, though this might not be necessary if the area receives sufficient fall rains.

► Melinda Myers of the Milwaukee, Wisconsin, county extension office reminds northern-area gardeners that optimum care throughout the year is the best protection for drought-stressed plants. Plants on unprotected sites will benefit from windbreaks or windscreens to protect them from dessication, and thorough winter mulching is also a good idea. Since food sources for rodents were particularly scarce last summer, gardeners might want to think of protecting their fruit trees with cylinders of hardware cloth wrapped around the trunks and sunk into the ground as protection against meadow mice. In mid-November, it's still possible to fertilize your lawn with a slow-release fertilizer, but be careful about fertilizing stressed plants—if they've suffered root damage, there may be even more damage from the fertilizer.

Seasons of drought offer a good opportunity to evaluate maintenance procedures, to see which plants are in the proper locations, and to evaluate tree damage.

► Mildred Pinnell of the Atlanta Botanical Garden in Atlanta, Georgia, also emphasizes the important role of proper maintenance in dry seasons. Cleaning beds, deadheading, and cutting back perennials after the first frost were some of her recommendations. She cautioned against severe pruning and reminded area gardeners to water plants well into the fall, even if they appear to be dormant.

► Mary Gourlay of the Bartlett Arboretum in Belle Plaine, Kansas, where drought conditions have been particularly severe this year, recommended deep watering with a root feeder, or alternately letting a drip line run near the roots of plants. She also recommends mulching with organic mulches and general cleanup to get rid of disease-containing leaves and debris.

► Roger Graves of the Smith College Botanic Garden in Northampton, Massachusetts, says that the best thing gardeners can do for drought-weary plants is to just "give them a good watering going into the winter." A Christmas tree grower (Scotch pine, Colorado blue spruce, and Douglas pine), he suggests that gardeners with very sandy soils containing few nutrients might want to drill feed around these species to get nutrients down close to the roots. "We haven't suffered from the drought as much as we might have this year," he says. "We got enough thunderstorms during the summer to relieve the worst effects."

Correction: In the July News Edition, page 12, *Celastrus scandens* should have been identified with Zones 3 to 8, not Zones 7 to 9.

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The Gardens of Coastal Iberia

Information: Leonard Haertter Travel Company, 7922 Bonhomme Ave., St. Louis, MO 63105 (800) 942-6666

June 2-5

Seaside Gardens of Rhode Island

Information: Triple A Travel, Polo Center, 700 Aquidneck Ave., Middletown, RI 02840 (401) 847-6393

August 1-21

U.S.S.R. and the Caucasus

Information: Corning Tours, Box 431, Albany, NY 12201, (518) 463-2160

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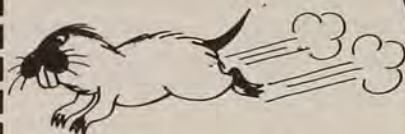
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Growing Tulips as Perennials? Research Shows How.

Dr. Paul V. Nelson, horticultural nutritionist at North Carolina State University and winner of the American Horticultural Society's 1986 G. B. Gunlogson Award for creative use of new technology, has some suggestions for gardeners who want to enjoy their tulips year after year. Dr. Nelson has experimented at NCSU for close to ten years with ways to grow tulips as perennials.

Gardeners have long thought that tulips do well in warm climates for only one season of bloom, but researchers at NCSU have developed a three-point formula for producing perennially-blooming bulbs.

Investigators watched the tulip bulb through its whole life cycle of planting, dormancy, growth, flowering, and the final state of transferring nutrients from the roots, stalk, and leaves to build a new bulb.

They found that within 48 hours after the roots come out, the bulb begins to take up nutrients and never stops until after flowering. To maintain the same number of blooms the second year, Nelson says, the bulb must replace itself with one of equal size and, in addition, must produce several other "daughter" bulbs of smaller size. This



The Darwin tulip 'Duke of Wellington'.

Courtesy of W. Atlee
Burpee & Co.

bulb-building requires an increased accumulation of nutrients.

Although phosphorus, potassium, and calcium are necessary nutrients, nitrogen is the most important one gardeners must supply. Fertilizing at planting (using a

common fertilizer such as 8-8-8) will nourish the bulb until its stalk breaks through the ground.

This fertilizer should be applied again in the same amounts six to eight weeks before bloom, "after shoots have emerged from the ground but before the leaves have opened," Nelson said. The second application of fertilizer will carry the bulb until the tulip blooms.

The gardener who wants to fertilize only once can use a longer-lasting slow-release commercial fertilizer, applied in the fall.

After the tulip blooms, it is important *not* to fertilize again until fall. The bulb does not take up nutrients in the summer between flowering and planting time, and an excess of nitrogen in the soil increases disease.

"Major bulb loss is (the result of) disease—not high temperatures," Nelson said. For this reason he opposes digging bulbs for their dormant period. Digging, he said, spreads fungus spores in the soil and storage often mixes healthy bulbs with diseased ones.

—North Carolina State University
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