

American Horticulturist

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A\$\$e\$\$ing Your Land\$cape

Most of us value our plants for the pleasure their beauty gives us and because they symbolize our skill as gardeners. Some—grandma's cuttings, gifts from friends, or souvenirs from trips—have additional sentimental value.

But let's be hard-nosed for a minute: they're also worth a lot of cold, hard cash. We spend a lot to buy them and take care of them. And if we can document their worth, we can often be reimbursed for their loss or damage to them through insurance, tax deductions, or civil claims.

Trees, in particular, are seen as valuable for both practical and aesthetic reasons, and appreciate at least five to 10 percent a year. The appraisals of mature shade trees are usually in four figures or even five. One Virginia nurserywoman who lost a five-and-a-half-foot diameter white oak was stunned to learn her loss was worth \$36,000.

The Council of Tree and Landscape Appraisers (CTLA), a coalition of five professions involved in landscape evaluation, believes that homeowners should be more aware of what they can do in the event of damage, and of some of the factors that will make their landscape worth more or less in the eyes of an appraiser.

Insurance

Check your homeowner's policy or talk to your agent about what the policy covers. Most states limit reimbursement to \$500 a plant. Some will pay only \$250. These amounts are generous in the case of herbaceous plants. But when it comes to trees, they will barely cover a sapling.

Some policies will also pay up to \$500 for debris removal.

Most policies cover casualty losses stemming from fire, explosions, riots,



Windstorm



Lightning



Ice Storm

vandalism, aircraft accidents, or vehicles that were not operated by occupants. This leaves uncovered most losses due to natural disasters such as wind or ice storms, floods, earthslides, hurricanes, tornadoes, or by the homeowner's vehicle.

Tax Deduction

If the loss falls into one of these uncovered categories, if you have no insurance, or if the losses exceed your coverage, you may be able to take a tax deduction for a non-business casualty loss to landscape trees and shrubs. However, the total losses for a tax year—and each loss has to be greater than \$100—has to exceed 10 percent of your

The Experts

► The Council of Tree and Landscape Appraisers, 1250 I Street NW, Suite 504, Washington, DC 20005.

► The American Association of Nurserymen, 1250 I Street NW, Suite 500, Washington, DC 20005.

► The American Society of Consulting Arborists, 700 Canterbury Road, Clearwater, FL 33546.

► The Associated Landscape Contractors of America, 405 N. Washington Street, Falls Church, VA 22046.

► The International Society of Arboriculture, P.O. Box 71, Urbana, IL 61801.

► The National Arborist Association, 174 Route 101, Bedford Station, Box 238, Bedford, NH 03102.

Courtesy American Society of Consulting Arborists

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Tornado

adjusted gross income. The loss on private property is the difference in the market value of your home before and after the loss.

This last requirement can be difficult to meet. The American Association of Nurserymen (AAN) and other CTLA groups have lobbied unsuccessfully for more official recognition of landscape value by real estate appraisers. Unofficially, real estate professionals do recognize the value of landscaping. Some believe it increases the value of a home 20 percent or more. Joel Albizo of AAN said that in one study, in which homes were evaluated before and after professional landscaping, the homes' values increased from seven to 14 percent.

There has been an "unofficial softening" by the Internal Revenue Service on landscape loss claims, said Erik Haupt, CTLA chairman and vice president for environmental affairs of the F.A. Bartlett tree company. However, he added, "It's subject to interpretation by regional chiefs, so it's not guaranteed. If you deduct alleged casualties and are audited for any other reason, there are chances of a dispute."

Still, courts have ruled against the IRS and for the taxpayer when a loss was challenged. For instance, one judge upheld a farmer's claim that his property had declined in value after he lost a number of trees to a tornado, because the judge agreed with the appraiser that the trees provided important functions such as shade and wind screening.

Civil Damages

If an outside party intentionally, unintentionally, or maliciously damages your landscape, you may be able to recover damages from the individual, corporation, or government involved. Owners of property that adjoins public property have even recovered compensation for damage to trees on the public land, on the grounds that they lost the enjoyment provided by those trees.

You may also be able to claim punitive damages that double or triple your compensation if the damage is judged to be malicious or intentional.

What They're Worth

The loss of small plantings, such as perennials and roses bushes, as well as trees less than eight inches in diameter at breast height, are reimbursed based on replacement value. That amount may include the cost of removing the damaged plant and planting the new one. It's a good idea to keep receipts for your landscape materials, but you should also keep in mind the appreciation factor, said Haupt. "You may have paid \$7.95 for an azalea when it was 12 or 15 inches tall, but it will be worth a lot more now if it's four feet tall and serves as a major improvement to your property."

Therefore you should take photographs of your landscape periodically, to document the size and health of your plantings, and save documentation of landscape care expenses. If your claim is disputed, the other party may try to claim that your plantings were already unhealthy.

The evaluation of trees more than nine inches in diameter is based on what is called the basic formula method. The number of square inches in a tree's cross section at breast height is multiplied by the current wood industry rate, now \$27 per square inch. The value is then adjusted—almost always lowered—according to such factors as species, location, and condition.

What You Should Do

The Council of Tree and Landscape Appraisers advises:

- Plan your landscape for both beauty and functional value.
- Protect and preserve your plantings to maintain their value.
- Take pictures of trees and other landscape plantings while they are healthy, for easier before and after comparisons.
- Check your insurance to see what it covers under what circumstances.
- Keep accurate records of landscaping expenses and appraisals.
- Call on the expertise of professionals at every stage of your landscape to maintain and document its value.

Devaluing Factors

A species will be worth less if it is common in the area where it is planted. But if it is rarely planted in your area because it can not be expected to thrive there, it will also be marked down by appraisers, as it will if there is a high incidence in your region of a disease to which it is susceptible. For example, the white oak can attain an incredible age and size on the eastern shore of Maryland, where it is the state tree, and it is assigned a high value there. The magnolias that are so stunning in Georgia aren't worth much in upstate New York, and an American elm loses points in the Midwest where Dutch elm disease is more rampant. Almost all species have at least one characteristic flaw that causes them to lose some value.

A tree is worth less if it is in an undesirable location. James E. Biller, a consulting arborist in Arlington, Virginia, noted that a tree is worth more on the south side of a house where it will shade you than on the north side where it will shade your neighbors. Any tree is worth more in the front yard of a house than the back yard of an apartment, he said, and otherwise valuable oak trees aren't worth much if they're dropping acorns in your pool.

Historic relevance adds value to a tree. For example, an aged chestnut growing at the American Horticultural Society's River Farm has more value because it is believed to have been planted by George Washington. The flip side of that, said Biller, is whether it could be seen as living on borrowed time.

Appraisers will also judge the tree's condition. Topping or other radical pruning will decrease value, as will any sign of pests, slow growth, damaged roots, or poor anchoring.

Professional Help

The organizations that make up the CTLA make a strong case for turning to their members for these appraisals. Biller said that the manual on which they base their judgments is so complicated, "you need another manual to tell you how to use it." Their literature describes a number of cases in which an expert opinion was crucial when a casualty loss was disputed.

After a loss is not the only point at which an expert opinion can be helpful. Professionals who care for your landscape should be chosen with the plants' long-term value, not just your immediate savings, in mind. And a good nursery professional, Biller added, should be able to advise you about the species and planting locations that will make your plant purchase not only a thing of beauty, but a wise investment.

Time Running Out for Many Natives

A survey by the Center for Plant Conservation indicates that some 680 native American plant species may become extinct in another decade, and more than 250 species may disappear in the next four or five years.

Some of these plants are known to have specific agricultural or industrial potential. Of more concern is the loss that they could represent to genetic engineering. About two-thirds of the endangered plants are related to domestic food and ornamental plants, and their genes could be used, for example, to breed sweeter peaches or more resistant roses.

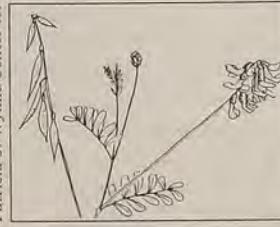
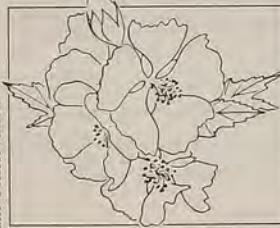
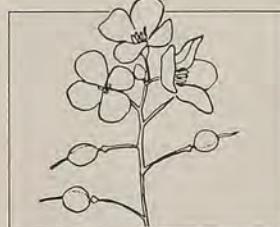
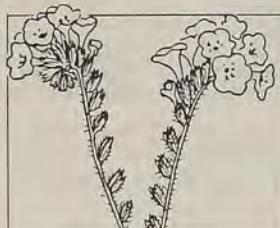
The center, headquartered in Jamaica Plain, Massachusetts, is a nonprofit coalition of 19 botanical gardens and arboreta concerned about protecting rare and endangered native plants. Its survey asked 89 botanists, horticulturists, and plant explorers throughout the country to evaluate the status of more than 800 plants that have been identified as endangered by The Nature Conservancy and the U.S. Fish and Wildlife Service. What the center wanted to know was how soon its members would have to act to save these species. The experts, when asked a year ago whether each plant was likely to become extinct within five years, five to 10 years, or would probably survive longer, estimated that about 25 percent of those on the list would disappear by 1993.

The survey results not only gave the center some time lines, but also gave it a geographical focus. About three-quarters of the endangered plants are found in Hawaii, California, Texas, Florida, and Puerto Rico, partly because these areas are being so rapidly developed. Other threats to the plants include competition from imported plants and pests, overgrazing, collection by wildflower hobbyists, and environmental changes.

Arboreta affiliated with the center have already begun collecting seeds and cuttings from endangered plants in their regions. A free copy of the survey results can be obtained by writing to the Center for Plant Conservation, 125 Arborway, Jamaica Plain, MA 02130.

Some of the threatened species include:

► In California, *Amsinckia grandiflora*, an annual with brilliant yellow-orange flowers, known from only one population on U.S. government property.



► In Texas, *Lesquerella pallida*, a bladderpod, which produces delicate white flowers and has crop potential for seed oil extraction. Unseen for 100 years, it was thought to be extinct until recently. Only four sites are known.

►

In Virginia, *Iliamna corei*, Peter's mountain mallow, a perennial shrub with stunning pink flowers. Only four plants have been identified.

► In New Hampshire and Vermont, *Astragalus robbinsii* var. *jesupii*, Robbin's milk vetch, a small perennial herb with delicate, violet, pea-like flowers, known only from three populations along the banks of the Connecticut River.

Patricia J. Wynne/Center for Plant Conservation

A Helpful Fungus Among Us

Most plants would fail to flourish if they had to rely on their own roots to provide water and nutrients.

Fortunately, in nature and in most healthy garden soils, they have an ally: mycorrhizal fungi, which establish a mutually beneficial relationship with plant roots. The plant provides the fungus with carbon compounds it needs to survive. The mycorrhizae—which means fungus root—act as an extension of the plant's roots, enhancing the uptake of water and other nutrients, particularly phosphorous. Studies have found that plants with this association have healthier foliage, bloom earlier and more profusely, and seem to have better resistance to harmful fungi, nematodes, drought, and salinity.

There are a number of different mycorrhizae, which may grow within the host's root cells (endomycorrhizae), between the cell walls (ectomycorrhizae), or both (ectendomycorrhizae). Ectomycorrhizae are the partners of many woody perennials, including birches, beeches, oaks, pines, spruces, and firs. Toadstools are the fruiting body of this type of fungi.

But the majority of plants of interest to gardeners, including grasses, ferns, and such trees as cypresses, maples, cherries, and ashes, join up with a type of endomycorrhizae called vesicular-arbuscular mycorrhizae (VAM). Recently, a VAM inoculant has become available to horticulturists and home gardeners. Whether the latter really need such a product under most conditions is still open to debate by scientists and experimentation by those who like to try something new.

Research Continues

Greg Johnson, general manager for crop protection and crop enhancement of Native Plants, Inc. (NPI), in Salt Lake City, Utah, said the company is still deciding how to market the product, called Nutri-Link. A jar of the product was offered through the Smith & Hawken spring catalog, but Johnson said that greater emphasis will probably be placed on a line of products that contain the fungi: for instance, peat moss or potting soil enhanced with Nutri-Link. The substance itself will be marketed primarily as a transplant aid, even though mycorrhizal relationships go on benefitting a plant throughout its lifetime. Johnson said NPI has been working on the product for seven years and research is far from complete. In fact, until now the big buyers



Courtesy Native Plants, Inc.



Courtesy Dr. Robert Augé

Top, a lantana shows reduced transplant shock after inoculation with mycorrhizae. Above, a scanning electron micrograph of a VAM outside the surface of a rose root.

have been researchers: 85 scientific organizations throughout the United States and as far away as Saudi Arabia, Italy, and France are conducting studies on mycorrhizae.

Dr. Roger Koide, assistant professor of biology at Penn State, and a graduate student, David Bryla, have been comparing mycorrhizal benefits to wild versus cultivated species, and found that cultivated oats and carrots benefit more from this symbiotic relationship than do their wild counterparts. This would seem to indicate that the plants in our gardens are lacking something that mycorrhizae provide.

Benefits Debated

But Dr. Koide was skeptical about whether home gardeners would benefit greatly from a mycorrhizal inoculant, since most garden soils already contain spores of the fungi, and at this point, the inoculant is relatively expensive. However, if soil is quite barren or severely disturbed, it could take several seasons until it is replenished with mycorrhizae, he said. "The spores are large

and soil-borne, not wind-borne, so that they have to be carried in by animals."

The inoculant would be useful to growers, who usually work with sterilized soil, he noted, and to plant breeders, who may want to see how their new plants perform when infected with the fungus, as they would be in a natural situation.

Dr. Robert M. Augé, assistant professor in the Department of Ornamental Horticulture and Landscape Design at the University of Tennessee, holds that a mycorrhizal product probably isn't needed in a well-managed greenhouse, although it might give plants some advantage during the high stress of shipping.

At this point, the fungus can't be grown alone in a culture, but must be grown on a plant, which makes quality control difficult, Augé said. "A batch may make your plants grow 10 percent better, or four times that much. But it's just a matter of time until someone finds a way to grow it on its own, and that will bring the cost down."

Environmental Impact

Incentive to use such a product will grow if environmental concerns begin to impinge on economic concerns of growers, he said. Not only are mycorrhizae a natural product, but they are incompatible with high levels of chemical fertilizers, and of course, fungicides. Koide and his colleagues have found that certain crops, such as onions, lettuce, and carrots, benefit more than others, such as tomatoes, from a mycorrhizal affiliation. Other plants that do not benefit from a VAM inoculant include many trees, and members of the orchid, mustard, spinach, carnation, and heath families.

But there is no question that most plants benefit in several ways, including greater resistance to diseases and pests. Koide and colleague Hector Flores are trying to discover just how this occurs. They

hypothesize that the fungus may stimulate plant roots to produce natural chemicals—alkaloids and polyacetylenes—that repel disease organisms and, when transported to the leaves, make them distasteful to insects and other pests.

NPI's Johnson holds that even plants in soil that already contains mycorrhizae could foreseeably benefit from an inoculant. "There are hundreds of strains, and some strains are particularly aggressive colonizers that could assist the plants better than the native strains." NPI's ongoing research will try to determine what strains benefit which plants under what conditions. "We now see a better response in neutral soils, for instance. We want to find a strain that works in all types of soils," Johnson said. They also hope to make the inoculant more cost-effective: their goal is a product that would cost about a half-cent a plant.

Sphagnum Warning

Gardeners who work gloveless with sphagnum moss, particularly if they are working with conifers or other prickly plants, should know the symptoms of cutaneous sporotrichosis, a disease caused by a fungus that is found in moss, rose branches, hay, soil, and decaying vegetation.

In the past, outbreaks of the disease have been limited to nursery workers and other professionals who have extensively handled these materials. But last year, among the 84 people in 14 states who contracted the disease following Arbor Day activities, more than half were home gardeners. All of those stricken in New York had handled blue spruce trees, which were believed to have caused breaks in the skin that allowed the fungus to enter the bloodstream, according to Stan Kondracki of that state's health department.

The first symptom is usually a raised red skin lesion on the hands or arms, appearing a week or more after exposure. This is followed by other lesions, which spread up the arms leaving red streaks. The lesions are slow to heal, with boil-like ulcerations, said Kondracki.

The effective treatment is a course of potassium iodide. Antibiotics aren't effective, and surgical drainage can make the lesions worse. Physicians in general practice are not likely to recognize the symptoms of this rare ailment, which cannot be diagnosed through a routine lab test, Kondracki said. Public health officials can be consulted about the appropriate test. He advised gardeners to wear gloves, long-sleeved shirts, and long pants when handling plants that might break the skin.

Gardener's Dateline

This is the month! See you at the AHS Annual Meeting in Minneapolis-St. Paul July 26-29.

► Through September 15. **Drugs and Pharmaceuticals in the Biblical World Display and Symposium.** Rodef Shalom Biblical Botanical Garden, Pittsburgh. Information: W. Jacob, 4905 5th Ave., Pittsburgh, PA 15213, (412) 621-6566.

► Through October 15. **"Buga '89" National Horticultural Show.** Frankfurt, Germany. Information: German National Tourist Offices, 747 Third Avenue, New York, NY 10017, or 444 S. Flower St., Suite 2207, Los Angeles, CA 90071.

► July 10-12. **Four-State Master Gardener Conference.** Iowa State University. Information: Janet Gardner, Office of Continuing Education, 102 Schenck Bldg., Iowa State University, Ames, IA 50011, (515) 294-5366.

► July 14-16. **Summer Conference and Celebration of Rural Life of the Natural**



A wide variety of succulents can be seen at the Inter-City Cactus and Succulent Show in Los Angeles.

Organic Farmers Association. Williams College, Williamstown, Massachusetts. Information: Julie Rawson, RFD #2, Barre, MA 01005, (508) 355-2853.

► July 15-16. **Ninth Annual Lotus Blossom Festival.** Frederick County, Maryland. Information: Lilypons Water Gardens, P.O. Box 10, Lilypons, MD 21717-0010, (301) 874-5133.

► August 13-16. **International Society of Arboriculture 65th Annual Conference and Trade Show.** Pheasant Run Inn, St. Charles, Illinois. Information: International Society of Arboriculture, 303 W. University Avenue, Urbana, IL 61801, (800) ISA-TREE.

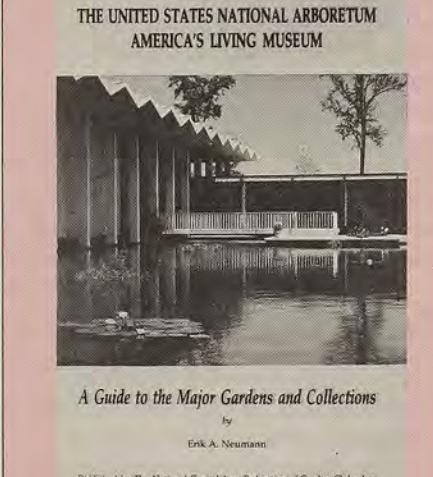
► August 17-20. **International Water Lily Society's Annual Symposium.** Hyatt Regency Alicante Hotel, Garden Grove, California. Information: International Water Lily Society, Box 10, Lilypons, MD 21717-0010, (301) 874-5133.

► August 19-20. **Inter-City Cactus and Succulent Show.** Los Angeles State and County Arboretum, Arcadia, California. Information: Larry Grammer, (213) 599-0856; Fred Hutzlesz, (818) 572-5583; Woody Minnich, (805) 944-2784.

► August 24-25. **Marigold Society of America Annual Meeting.** Huber Heights, Ohio. Information: William R. Morris, President, P.O. Box 2489, El Amcero, CA 95618.

► August 25-27. **San Francisco County Fair and Flower Show.** County Fair Building. Information: Sandie Wernick, 1690 Broadway, Suite 705, San Francisco, CA 94109, (415) 928-7414.

► August 26-27. **Seattle Flower Show.** Seattle Center's Exhibition Hall. Information: 1111 Tower Building, Seattle, WA 98101, (206) 343-1543.



Those planning a trip to the Washington, D.C., area won't want to miss the U.S. National Arboretum. And now a guide is available to help them plan their tour. The guide can be purchased for \$4.95 plus \$1.50 shipping and handling by writing to the U.S. National Arboretum, Arbor House Gift Shop, 3501 New York Ave. N.E., Washington, DC 20002.

AHS Bulletin Board

Success with Seed

So you think you could never grow anything exciting from seed? Just do what Howard and Ruth Crosby have done: read some books and learn from your failures.

In eight years, the Hermon, Maine, couple have turned their "little place" into a four-acre arboretum, using primarily cuttings and seeds that they obtained through three seed exchanges, including the Annual Seed Program of AHS.

The Crosby garden often catches the eye of those traveling U.S. Route 2 in Hermon, which is about 15 miles west of Bangor, and a sign assures them that visitors are welcome. The Crosbys aren't selling anything; they only want to share the beauty they've created. Highlights include hundreds of dwarf irises (they obtain seed from the Species Iris Group of North America) and Ruth Crosby says she takes special pride in the 25 to 30 iris species she has grown from seed); "The Cathedral," a circle of shrubs surrounding a collection of more than 100 herbs; and the "Ledges," a new area for rock garden plants. Mrs. Crosby also obtains seed from the American Rock Garden Society. Another new venture is a grass garden, and Mrs. Crosby said they took advantage of the AHS program this year to obtain lemon grass and several other grasses. "We get as much as we're allowed," she laughed. For the Crosbys, the seed exchanges are just that: they gather seed from their own plants and donate to all three programs that they order from.

How did they learn so much about seeds? In a feature story that appeared in the *Bangor Daily News*, Howard Crosby told reporter John A. Johnson that Ruth was a longtime iris grower who got him involved in gardening when he retired as a professor of electrical engineering at the University of Maine. As they've branched out from irises, she's read books and he's done the physical labor, he said. "We've had many failures, but we've learned from each of them." Asked for advice that might help beginning seed growers avoid errors, Mrs. Crosby said it's crucial to start the seed at the right time, and to know whether each type of seed requires light or darkness for germination. She said she's been helped immensely by reading Park Seed's book, *Success with Seeds*. "But mostly," she said, "we've had a lot of experience."

Like many other gardeners, the Crosbys



Scott Haskell/Bangor Daily News

AHS members Ruth and Howard Crosby have created a four-acre arboretum, much of it from seed, in Maine's challenging climate.

have found that the hobby expands to fill all available space. They now have seedlings and cuttings in southern windows, cold frames, and an outbuilding they converted into a lean-to greenhouse.

Of the Crosbys' 90 acres, most of both field and swamp have been kept natural. The Bangor Nature Club is now giving them some help tending it, and the Crosbys hope that they or some other group will help preserve it for their grandchildren and others. "We're planting trees now that won't reach their prime for 20 or 30 years," they told the *Daily News*, "but we're doing it because we hope to leave this place to everyone. If we can do that, it will mean more than if we had left money."

Plumeria Seed

Elizabeth H. Thornton and Sharon H. Thornton, authors of *The Exotic Plumeria (Frangipani)*, were concerned that the listing for *Plumeria* seed in our January seed catalog indicated that no reliable germination information was available. They brought to our attention the advice in their book, which Elizabeth Thornton, founder of the Plumeria Society of America, Inc., wrote in 1978 and revised and expanded with Sharon Thornton in 1985.

It suggests soaking the seeds between moist paper towels overnight to determine which ones swell and can be expected to sprout. The soil mix should be at least three inches deep and very friable and loose.

Carefully place each seed just below the surface of the soil mix with the wing protruding vertically above the mix. Keep it moist and above 75° in full sun.

Between five and 21 days later, sprouts encased in fibrous sheaths will break through the soil. If the seedling has not broken through the sheath to release the two cotyledons, the seed leaves will turn brown in several days. Moisten the sheath with water and delicately peel or slide off this covering without breaking the cotyledons; the first true leaves should appear approximately seven days later.

There is no guarantee what color, shape, size, or fragrance the blossoms of plumeria grown from seed will be. A few may resemble the pod parent, but more often a red or pink parent will produce a yellow- or white-flowering seedling.

Plumeria culture is not restricted to Zone 10, but all except *P. obtusa* (also known as 'Singapore') go dormant during the winter. During this time, they need absolutely no attention except protection from freezing temperatures in a basement, attic, garage, closet, or greenhouse.

Authors Visit River Farm

AHS was delighted this spring to host two British plant experts and authors: Rosemary Verey, whose recent books include *A Garden in Winter* and *A Flower Arranger's Garden*; and Hazel le Rougetel, author of *A Heritage of Roses*.

Verey, who described her dream garden in the June *American Horticulturist*, was invited to River Farm last fall by AHS President Carolyn Marsh Lindsay during a visit to the British Isles. AHS staff and board members hosted a reception and luncheon for Verey and took her on a tour of the grounds on a perfect spring day when the river banks were splashed with the purple, gold, and white of the wildflower meadow and Virginia's famous dogwoods were still in bloom.

Le Rougetel, a designer of informal rose gardens in which roses are mixed freely with other plants, presented a lecture that, like her book, was a trip through time and around the world to look at the history of roses, from their symbolism in medieval times to today's newest hybrids and the return of interest in old roses.

A Sycamore for Tomorrow

A spreading sycamore sapling, descended from one that shaded George Washington's headquarters when he fought the battle of White Plains, New York, in 1776, was planted at AHS's River Farm headquarters to observe National Arbor Day on April 28.

Co-sponsoring the event with AHS was the American Forestry Association (AFA). AHS is supporting AFA in its Global ReLeaf effort, through which it is encouraging Americans to help reduce the greenhouse effect by planting trees. Trees consume carbon dioxide, an excess of which bears most of the blame for the current global warming trend. Guests at the event included Alan Hill, chair of the U.S. Council on Environmental Quality, and representatives of the American Seed Trade Association, the U.S. Botanic Garden, the National Park Service, the National Parks and Conservation Association, the U.S. Forest Service, the American Association of Nurserymen, the American Society of Horticultural Science, the World Resources Institute, and a number of local officials.

Also attending were 36 students from St. Stephen's Episcopal Day School for Boys in nearby Alexandria, Virginia. One of them, Kelly Radford, helped officials plant the tree. "What we are saying by planting this tree is that we think it's a wonderful thing for us and for our planet," AHS Executive Director Frank Robinson told the boys. Dr. Henry M. Cathey, director of the U.S. National Arboretum and a member of the AHS board, told the group: "Green is the color of hope. And in the green of our plants is our hope for survival."



Student Kelly Radford helps American Forestry vice president Richard Krouse and AHS's Frank Robinson plant the Arbor Day sycamore.

Courtesy American Association of Nurserymen

Winning Exhibits

American Horticultural Society Executive Director Frank Robinson presented special citations on behalf of the society to the most outstanding exhibit at five of this spring's major flower shows.

The citation, presented annually, is given "for an exhibit of horticultural excellence that best demonstrates the bond between horticulture and the environment, and inspires the viewer to beautify home and community through skillful design and appropriate plant material."

The winners were:

► **International Atlanta Flower Show:** Habersham Gardens in Atlanta, for an exhibit of mountain plants.

► **New England Flower Show:** Allen C. Haskell & Son Nursery in New Bedford, Massachusetts, for an azalea landscape.

► **New York Flower Show:** City of New York Department of Parks and Recreation,

for a display using members of the rose family.

► **Philadelphia Flower Show:** Robert W. Montgomery Landscape Nursery in Philadelphia, which designed a landscape for a barn converted into a house.

► **Washington Flower Show:** National Cathedral Greenhouse in Washington, D.C., for an herb garden.

Flag Wavering

Several months ago, AHS undertook a graphic redesign of our news edition that included its flag—the way the publication's name appears at the top of the front page. However, the U.S. Postal Service has ruled that the new "News Edition" flag made the edition appear separate from the *American Horticulturist*, and that its continued use would disqualify it from our current second-class postal permit. A new, approved flag appears on page one this month.

PERENNIALS FOR AMERICAN GARDENS

by Ruth Rogers Clausen
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The best, most complete sourcebook on perennials ever published!

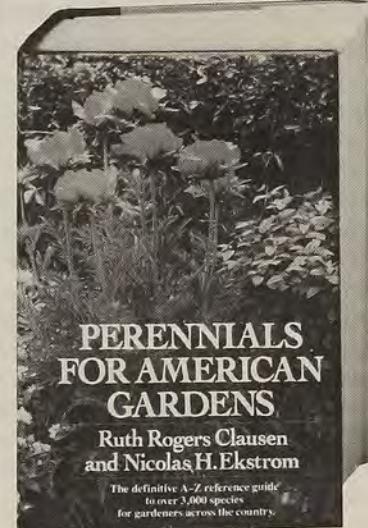
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Brooklyn Botanical Garden



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Gardener's Bookshelf

The Healthy Garden Handbook

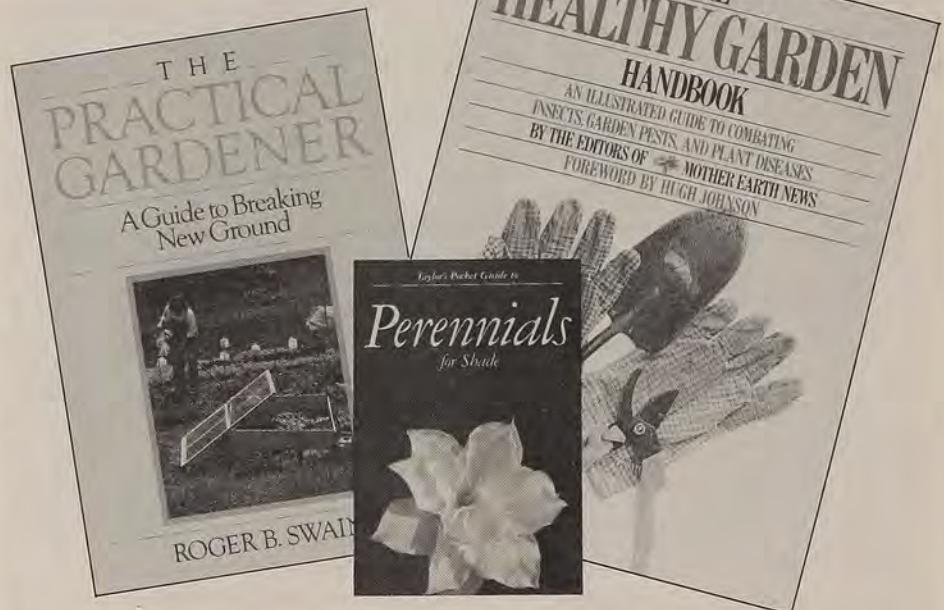
A growing number of us want to garden "naturally," but many of the older organic gardening books can seem a bit dated and preachy. Here's one that's well-organized, beautifully illustrated, and straight-forward. Although the authors focus on the vegetable patch, a section that should be helpful to any gardener is one that contains color photos of insect friends and foes in all their life stages and suggests ways to encourage or discourage them accordingly. Another chapter lists problems common to the most popular homegrown vegetables and ways to avoid them. By the editors of *Mother Earth News*. Fireside Books, New York, 1989. 192 pages, color drawings and photos. Publisher's price: hardcover, \$22.95; softcover, \$11.95. AHS member prices: hardcover, \$18.35; softcover, \$9.55.

Q&A: Hundreds of Can-Do Answers to a Gardener's Toughest Questions

Just in time for the trouble-shooting season, here's a wealth of information with an organic bent packaged in an easy question-and-answer format. Topics include the basics—soil and mulches and problem prevention—as well as woes related to specific plants. Nearly 150 pages deal with fruits and vegetables; another 60 are devoted to annuals, perennials, bulbs, houseplants, trees, lawns, and shrubs. The last three chapters offer tips for control of insects, fungi, and weeds. By the editors of *Organic Gardening*. Rodale Press, Emmaus, Pennsylvania, 1989. 330 pages. Publisher's price: hardcover, \$21.95. AHS member price: \$17.55.

Taylor's Pocket Guides

Here are six miniature versions of Taylor's popular guides to gardening, adapted from *Taylor's Encyclopedia of Gardening*. While they contain fewer flowers than the regular guides, they are also more specific in scope. Each book—*Bulbs for Spring*, *Bulbs for Summer*, *Perennials for Sun*, *Perennials for Shade*, *Modern Roses*, and *Old-Fashioned Roses*—provides descriptions, color photos, and histories for 79 flowers. And as the series' name implies, the four-by-six-inch size makes them handy to stick in a pocket or purse for a game of "name that plant" when visiting a public garden or "find that plant" at a local nursery. Consulting editors Ann Reilly (four volumes) and Maggie Oster (two volumes). Houghton Mifflin, Boston,



Massachusetts, 1989. 127 pages. Publisher's price: softcover, \$4.95. AHS price: \$3.50.

The Practical Gardener: A Guide to Breaking New Ground

Another basic gardening book? Well, yes and no. The consensus among our staff was that this offering, by a biologist who is a co-host of PBS's *The Victory Garden*, was too much fun to leave out. Like Frederick McGourty in *The Perennial Gardener* (see the June *American Horticulturist*), Swain has a self-deprecating style that reassures

those of us who've had a failure or two. There's a spate of tips for the beginner; for the experienced, it's like visiting the fellow gardener whose experience you respect—although you might want to argue with him on a point or two—and whose humor you enjoy. He also tosses in a boatload of extras, such as how to make a \$25 garden bench or boil up the garden excess in a fiery chili. By Roger B. Swain. Little, Brown and Company, Boston, Massachusetts, 1989. 268 pages. Publisher's price: hardcover, \$18.95. AHS member price: \$17.10.

Book Order Form

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AHS Board of Directors Nominees

The following individuals have been nominated to serve three year terms on the American Horticultural Society's Board of Directors beginning with the annual meeting at the end of this month:

George Ball Jr. is president of the Flowerseed Group of PanAmerican Seed Co., a Division of George J. Ball, Inc., in West Chicago, Illinois. He presides over operations in Europe, Latin America, and the United States for his company, which produces and sells hybrid and open-pollinated annual flower seed to the greenhouse, cut flower, mail order, and packet industries. He attended Bard College, Annandale-on-The-Hudson, New York.

Dr. Sherran Blair has been president and chief executive officer of the First Community Bank in Columbus, Ohio, since 1984. She holds degrees from the University of Kentucky and the University of Massachusetts at Amherst, has served as president of the Organic Gardening Club of Central Ohio, chairman of the Central Ohio Unit of the Herb Society of America, and is currently third vice president (financial) of the Herb Society's national organization. She is also active with the Inniswood Society of the Inniswood Metro Gardens in Columbus.

K. Albert Ebinger is treasurer of Ebinger Brothers Leather Company, Inc., and president of Peatfield Associates in Ipswich, Massachusetts. He is a trustee of Ipswich Savings Bank and has served on the advisory board of the First National

Bank of Ipswich since 1959. He is a graduate of Colby College.

David Lilly was chief executive of The Toro Company for 23 years. He resigned in 1976 to accept a presidential appointment to the Federal Reserve Board. After he returned to Minnesota from Washington, D.C., he served as vice president for finance and operations at the University of Minnesota and as a special consultant to the president. A Dartmouth University alumnus, he has served on the boards of Carleton College, Thayer School of Engineering at Dartmouth, St. Paul Academy, and Common Cause.

Elvin McDonald is director of special projects at Brooklyn Botanic Garden. He transplanted his first bean at age three and at age 14, founded the American Gloxinia Society and began publishing its bimonthly magazine. He has been author, photographer, editor, or producer of 19 books, and after a 10-year hiatus from publishing, is producer of photographs for a second edition of *First Garden* by C.Z. Guest. He was a co-founder of *Flower and Garden*; garden editor for *House Beautiful*; originating editor-in-chief of Ortho Books; and has made a number of media appearances and lecture tours to promote the rewards of gardening and gardening as therapy.

Jane N. Scarff is vice president of Scarff's Nursery in New Carlisle, Ohio. A five-generation production nursery on 700 acres, it includes retail and landscape divisions. Organizations that Scarff has

served as an officer or advisory board member include the Horticultural Research Institute of the American Association of Nurserymen; Ohio Nurserymen's Association; Wegerzyn Garden Center, a community garden center in Dayton, Ohio; the Agricultural Technical Institute of The Ohio State University; and the National Arboretum.

Virginia Urschel is a residential realtor with Pitts and Bachmann Realtors in Montecito, California. A former high school teacher, she received her master's degree from California State College. She is a longtime avid gardener whose current special interest is roses, and has traveled extensively to visit famous gardens in the United States and Europe.

Helen Fulcher Walutes is a Mount Vernon, Virginia, attorney, serving her second term as president of the Alexandria Council of Garden Clubs, which is composed of delegates from 19 Alexandria area garden clubs. The council has developed gardens at historic estates in the Washington area and is currently working with the National Park Service to extend the Johnson Beautification project along the George Washington Memorial Parkway to Mount Vernon.

The following incumbent board members have been nominated for re-election: Richard C. Angino, Harrisburg, Pennsylvania; Dr. Henry M. Cathey, Washington, D.C.; Mrs. John M. Maury, Washington, D.C.; and Mrs. Jean Verity Woodhull, Dayton, Ohio.

Going Native

The National Wildflower Research Center has published a *Wildflower Handbook* that provides a state-by-state listing of nurseries that offer native trees, shrubs, flowers, and grasses, plus tips on care, garden design, and roadside planting, botanical gardens where native plants are grown, and organizations with additional resources.

More information can be obtained by writing to The National Wildflower Research Center Clearinghouse, 2600 FM-973 North, Austin, TX 78725, or calling the clearinghouse at (512) 929-3600.

Just for Texans

The *Texas Native Tree and Plant Directory*, recently revised by that state's department of agriculture, identifies 370 native plants suitable for landscapes there and more than 400 Texas nurseries that grow natives.

For a copy of the directory, write Texas Dept. of Agriculture, Marketing Program, P.O. Box 12847, Austin, TX 78711, (512) 463-7624.

AHS Board of Directors Proxy

Notice of Election in conjunction with the 44th Annual Meeting of the American Horticultural Society. Cut out proxy and return by July 20, 1989, to President, AHS, 7931 East Boulevard Drive, Alexandria, VA 22308.

I will not be able to attend the Annual Meeting of the American Horticultural Society on July 27, 1989. Please assign my proxy to AHS President, Carolyn Marsh Lindsay, or

Vote for twelve.

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to cast my ballot in the annual election of the Society's Board of Directors, and to cast my ballot in other matters that may properly be brought before the Annual Meeting with the same effect as though I were personally present.

Dogwood Anthracnose Still a Mystery

A decade after dogwood anthracnose was first identified, researchers don't know where it came from or where it's going.

They don't know whether it was the result of a genetic mutation, a fungus that was here all along and was triggered into epidemic proportions by environmental changes, or an imported pathogen. The puzzling factor, says Dr. Craig R. Hibben of the Brooklyn Botanic Garden Research Center, is that dogwoods on both coasts are suffering from exactly the same fungus, although the East Coast pattern is much more widespread.

So far, the fungal disease has been running "right down the Appalachians," says Dr. Frank Santamour, a U.S. Department of Agriculture researcher based at the National Arboretum in Washington. It has decimated dogwoods in forests as far north as New York and as far south as Georgia. It has killed half the dogwoods in Pennsylvania, 85 percent of those in Catoctin Mountain Park in Maryland, and is rampant in the Great Smoky Mountains National Park of Tennessee and North Carolina. Trees farther west, as well as urban trees, generally have remained untouched, although it has been reported in a handful of commercial North Carolina nurseries.

No Resistance

But a recently completed study shows that, should the fungus reach them, there is no reason to hope that any native trees will display genetic resistance.

Santamour designed a study in which 20 native dogwoods from 17 states as far west as Michigan and Oklahoma were planted in the Catoctin Mountains near Camp David, Maryland, where others had been inoculated with the fungus. In a little more than two years, all of them had died. "The fungus is spread by wind and water movement," he explains. "Because their native range is interlaced with shopping centers and roads, we can't predict how far, or how fast this will spread."

Ornamental dogwoods inside the park where the study was conducted were untouched. What is apparently the same fungus has been identified on the mountain or Pacific dogwood, *Cornus nuttallii*, but that tree has far less range.

Interventions

Hibben and a colleague, Margery Daughtrey of Cornell University's Long Island Horticultural Research Laboratory,



Courtesy Dr. Craig R. Hibben

Dogwood anthracnose should be suspected if trees show massive leaf spotting and then dieback of twigs as this growing season ends.

have identified three chemicals that he says hold the fungus "to an acceptable level": Manzate 200, Daconil 2787, and Benzate, in that order of effectiveness. However, all three contain suspected carcinogens, and three to four applications are needed at 10-day intervals. Other preventive measures include pruning dead twigs, where the infection usually begins, and sterilizing tools. Trees planted where they receive sun and air circulation, as contrasted with the shady woods of the mountains, seem to fare better once infected, they say.

Dogwood owners should not be overly anxious about the fungus. Observes Santamour: "Dogwoods are susceptible to other problems, such as borers. Lawnmowers probably do more damage than anything." Nor should they go overboard with sprays at the first sign of leaf spots. "There are other leaf-spot diseases that, for the layman, would be hard to distinguish from anthracnose and may be as virulent. It could be just plain, bloody drought." The leaf spots are brown with purple margins. If your dogwood shows massive leafspotting and twigs begin to die back at the end of this season, then you may have reason to suspect anthracnose, he said.

Alternatives

He predicted a surge in popularity of *Cornus kousa*, an Asiatic dogwood that some gardeners find at least as desirable as *C. florida* because of its later and often longer bloom. In Santamour's opinion, "It's a tree that's best viewed from a second story window, though, since its flowers tend to all be erect."

Another alternative is just around the corner: a hybrid obtained by crossing

Cornus florida and *Cornus kousa* has been developed at Rutgers University. Bred for resistance to the dogwood borer, it has shown no signs of anthracnose in spite of being surrounded by native dogwoods that are dying. There are six different cultivars, says the breeder, Dr. Elwin R. Orton Jr., all with different times of flowering. "This is a whole new race of dogwood," he promises. Orton says patents are being acquired and the hybrid should be available to the public through selected nurseries in about two years.

Medicinal Plants: What Will We Lose?

If you need to be convinced of the need to save endangered plants, talk to the staff of the Natural Products Branch at the National Cancer Institute (NCI).

Between 70 to 80 percent of the drugs we are using today had their root in a natural product, said the branch's Kenneth Snader. Digitalis for heart patients and a substance for treating leukemia both came from plants, and currently, several plant extracts are showing activity against the AIDS virus. Castanospermine, extracted from the seeds of the Australian black bean tree, has shown promise against AIDS in conjunction with other substances. Because of the tree's beautiful wood, it was being heavily harvested, and is now protected by the Australian government; efforts are now directed toward synthesis of the active substance. Taxol, a substance isolated from the bark of the Pacific or Western yew, appears effective against melanoma and ovarian cancer. However, the yew is such a

Irrigation Trickling Down to Home Gardens

Sophisticated irrigating systems have been around for a decade, but have only recently grabbed the attention of home gardeners anxious about drought but jealous of their leisure time.

There are two basic types of water-conserving "trickle" irrigation systems: drip, in which solid hoses are connected to emitters that dispense water at each individual plant; and soaker hoses, which ooze water along the length of the hose. (Soaker system manufacturers emphasize that they should not be confused with sprinkler hoses, which squirt streams of water into the air.)

Generally, drip systems are more expensive, and much more difficult to install and move. They offer greater control at each plant with less waste between plants than soaker hoses. For example, four emitters can be installed around a large tree and one at the foot of a rose bush on the same line. Drip systems are usually run along the surface of the ground (although their hoses can be covered with mulch) while the soaker hoses are buried.

However, both systems come in a wide range of prices and styles. The simpler drip systems can reportedly be installed in a small bed in an hour or two while the more sophisticated and effective of the soaker systems can also require extensive planning before installation. Both offer an array of hose connectors and such options as filters, cleansers, fertilizer injectors, computerized timers, and flow regulators.

Nursery Manager magazine has listed some pros and cons of drip systems. With their permission, we adapted the list for home gardeners and to cover soaker systems as well.

Advantages

- Money savings. Little water is lost to wind drift, evaporation, or runoff. Trickle systems require less pressure, thus less energy is needed for pumping. The denser your plants, the greater your savings.
- Time and energy savings. Much of your watering can be automated. You can also add a fertilizer injector; more efficient fertilization can also add to your money savings.
- Healthier plants. You have greater control over the amount of water your plants receive. It goes to the roots and not the foliage, reducing the likelihood of fungus caused by wet leaves.
- No soggy ground around plants, so you can keep working nearby. With drip, particularly, there should be fewer weeds between rows, further saving time or money needed to eradicate them.

Disadvantages

- Initial investment can be high and installation time-consuming. However, prices have been going down and attachment of parts made simpler.
- In some systems, emitters and hoses can become clogged by soil particles, algae, or minerals in the water. As a result, the systems may need frequent maintenance or special filters.
- Moisture in the soil is limited to the immediate area of the emitter or hose.
- Drip systems cannot be moved from area to area; this is easier with a soaker hose if you do not bury it deeply but lay it on the surface and cover it with mulch to prevent evaporation.
- Systems can be damaged by rodents, insects, or you, if you cultivate in the wrong place.

slow-growing tree that one or two major collections would cause environmental problems; the U.S. Forest Service is helping to control collection of its bark.

The branch has three contracts—with the New York Botanical Garden, the Missouri Botanical Garden, and the University of Illinois-Chicago—for collecting 20,000 plant samples from the tropical rain forests in Africa, Madagascar, Central and South America, and Southeast Asia. Although in some cases promising leads for anti-AIDS or anti-cancer substances come from scientific

literature, plant hunters under contract with NCI often consult shamans and medicine men about what they use to treat rain forest natives.

"We want to get these substances into the system before they're destroyed," said Snader. But Mark Plotkin, director of the World Wildlife Fund's plant program, has estimated that 98 percent of the plants in the earth's rapidly disappearing rain forests have not been examined. Lamented Snader: "We will probably never know what we missed."

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Regional Notes



► "There is a tendency in the West to overwater," warns W. Richard Hildreth, director of the State Arboretum of Utah in Salt Lake City. He advises gardeners in his area to listen to weather reports for information on evapotranspiration, which will tell them how much irrigation is needed to make up for water lost to the heat. Water lawns deeply but infrequently to establish deep roots that can get by longer without watering, and mow high for better weed, insect, and disease resistance. Mulch, mulch, mulch, with anything that's handy, both to reduce the need for watering and to keep down weeds. "Do anything you can to prevent weeds from going to seed, if you have to get out there and knock 'em down with your croquet mallet."

Don't neglect to deadhead perennials and annuals. If perennials are finished blooming or annuals are scraggly, cut them back severely to encourage additional bloom and/or bushier foliage. Petunias, pelargoniums, and nicotianas tend to get tobacco hornworm, which can be treated with *Bacillus thuringiensis* (Bt), a biological control. It's a good time to spray for peach borers, which begin their dirty work in July.

Late summer is not too early to plant trees and shrubs from containers, if you're careful to remove any burlap or papiermâché that might be higher than the soil line and to water deeply, about once a month. "You don't want them going into the winter dry." And don't forget the fall veggies: peas, spinach, lettuce, bush beans, members of the cabbage family.

► Joel Miller, horticulturist at the Des Moines Botanical Garden, echoes Hildreth's emphasis on mulching and sending trees and shrubs into the winter well-watered.

"Use whatever mulch is available and free. Our power company here makes bark available to us. But it can deplete the nitrogen, so you may want to add some." From nearby stables, they obtain sawdust

In a hot, dry summer, don't overwater or stress plants with weeding or chemicals, but mulch like mad.

and horse manure. (If the mixture has not been composted for at least three years, he warns, it poses a danger of nitrogen burn.) Mulching has helped their gardeners cut back on chemical weed control. Although broad-leaved weeds that survive under large bark chunks seem to have more stubborn roots, those few weeds that appear from under fine-textured mulch are easily removed by hand, Miller says.

Start now to prepare beds for fall planting, watering for up to three hours every two weeks. "You really need to build up moisture before you plant. Roots will be growing up to December 1." In choosing what to grow next year, gardeners should observe what does well for them under low-water conditions this summer. A dwarf globe amaranth, 'Buddy', has done particularly well for their garden, Miller says. While New Guinea impatiens won't survive an Iowa summer, other impatiens do surprisingly well in the 100°-plus heat—with even more bloom than in the shade—as long as their roots are kept cool. They are being bred tougher, says Miller, as are pansies; last year, the garden started pansies in August and kept them in an unheated cold frame through the winter.

► Whether or not a drought materializes in the South this summer, there's no question that the region will have heat: July and August temperatures are usually well into the 90s, said Gary Gerlach, director of the Birmingham Botanical Garden. When rain is scarce too, he advises heavy mulching, early morning watering—and otherwise leaving plants alone.

Heavy mulching is especially important with new plants. Gardeners should create saucers in the soil around a newly planted tree or shrub to retain water; those who find the saucers unattractive can fill them with mulch and the plant will still benefit. Any mid-summer irrigation at the garden is usually done for two to three hours around dawn to minimize evaporation.

Gardeners should avoid putting any additional stress on plants during a drought. "We try not to weed or disturb the ground," says Gerlach. Chemical pesticides and fertilizers are avoided, except on roses, which are well-irrigated on Wednesdays before spraying for blackspot on Thursdays.

Early summer annuals need to be replaced at this time, especially in areas of heavy pedestrian traffic. Verbena and salvia are two that can withstand the heat. Flowering shrubs at their peak now include crape myrtle, vitex, and oak leaf hydrangea. Native to this area, the oak leaf hydrangea loves poor, rocky soil, can handle wet ground, and will grow to six or seven feet tall with two- to three-inch-diameter canes. A choice cultivar, developed in Birmingham and not fully hardy farther north, is 'Snowflake', whose inflorescences bloom white for nearly a month then turn reddish-tan in the fall.

► Having a case of the late summer blahs because all your garden color fled with the spring? Two ideas that provide both color and interesting foliage contrasts are being demonstrated at Brookside Gardens in Wheaton, Maryland.

Horticulturist Pam Stenger suggests ornamental vegetables with attractive flowers, foliage, and form, combined with annuals, vegetables, and herbs chosen to complement them. For instance, fine feathery carrot tops provide a stark contrast to coarse, grassy corn; glossy white stems of Swiss chard contrast with the brilliant scarlet flowers of runner beans; the sprawl

of cherry tomatoes contrasts with the upright stalks of Brussels sprouts.

Next year, you may want to experiment with the light pink fruit of 'Rosa Biana' eggplant; bright red, tear-shaped 'Kuri' squash; or the red flowers and winged pods of the asparagus pea. A few of the vegetable and flower combinations suggested in the brochure that accompanies the Brookside display are okra 'Burgundy' combined with cosmos, ageratum, and white alyssum; tomato 'Tigerella' combined with red petunias, yellow marigolds, and basil; eggplant 'Black Beauty' combined with purple alyssum, ageratum, and tricolor sage.

And if you think of caladium as a shade plant, think again. Many cultivars—such as 'Frieda Hemple' and 'Postman Joyner'—are at their best in the bright sun and withstand the heat of summer. Others present a whole new face: 'Mrs. F. M. Joyner', which in the shade is mostly white with rosy-red veining, turns a bronzy red in the sun.

Some Rest for the Wicked

Container plants are a demanding, thirsty lot and a particular source of worry to vacationers. To give yourself more time for other summer activities, or before taking off for the beach this year, you might want to experiment with creating some wicks for your planters.

Robert Farris, president of the Indoor Gardening Society of America, says he creates plant wicks with such household materials as fiberglass, nylon clothesline, and strips of old pantyhose, and has found them as effective as commercial wicks or the superabsorbant polymer soil additives.

The most convenient time to install wicks is when you first pot a new plant or when you repot an old one, he advises. You can save time by preparing five or six containers with wicks and placing them on standby. The wicks are spread out across the bottom of each pot like five fingers. One end is drawn down through the pot's drainage hole and allowed to rest in a tray, saucer, or other container that will serve as the water reservoir. The planter is raised above the reservoir on legs or a little platform. Through capillary action, the wick will draw water from the container into the pot.

When you're ready to pot, says Farris, avoid using the usual pebbles or clay pot fragments at the bottom, or you will keep the water from reaching the plant. Otherwise, pot as usual: add some potting medium, moisten it, and transplant the plant, filling in with additional potting



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medium, and water the plant well. Then place your plant over the bottom container and water to a level below the plant, making sure the bottom edges of the wick are reaching the water source.

In a recent issue of *Indoor Gardener*, his society's newsletter, Farris reported that when he experimented with wicking several begonia plants, they grew faster and developed twice the usual number of leaves, which were more colorful and shiny. Other plants that demand constant water and benefit from wicking are hibiscus, fuschia, New Guinea impatiens, and azaleas.

Although Farris is primarily an indoor gardener, in the summer he does move some plants outdoors, where they also benefit from wicking. For best results indoors, he says, keep your room temperature above 65° F at night and above 70° F during the day. When the temperature drops below 65°, the plants do not grow fast enough to absorb the water and may develop root rot.

The length of time you can leave your plants unattended depends on the size of the water reservoir, but two weeks of vacation or even three should present no problem, he says.

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Gardener's Q&A

Members ask about spots on African violets, delphinium crown rot, Norfolk Island pine failures.

Q: I have African violets growing under grow-lights in a cool room that averages 55 to 65° F in the winter and 65 to 75° in the summer. I water them two to three times a week from the bottom, and I fertilize with an African violet fertilizer. They are vigorous growers and bloom profusely, but now I am seeing brown spots on the leaves. What is causing the spots?

—R.T., Marietta, Georgia

A: Your brown spots are caused by watering with cold water which has destroyed the green chlorophyll in the leaves. In African violets, all the chlorophyll is found in a single layer of cells near the upper surface of the leaf. If the chlorophyll in that layer is broken down, then the green color disappears and the color of the underlying leaf tissue is exposed.

For African violets, it is crucial that the water temperature is warm, about 90° F. Of course, you needn't use a thermometer to check the water every time you water your plants. Just touch the water, and if it feels pleasantly tepid then it is okay to use. For those leaves that already have brown spots, the best you can do is remove the leaves and dispose of them.

Q: I need a little help in growing my delphiniums. I start the Pacific hybrids from seed and plant them out in the garden each spring. I am careful that the plant crown is well above ground level and kept moist. They grow well for a short time, then about three-fourths of them die at the crowns. Do you have any suggestions?

—F.S., Olmsted Falls, Ohio

A: From your description, it sounds as if your delphiniums are suffering from crown rot. Crown rot is caused by fungi that live in the soil and enter the plants through the roots and the crown. For this reason, delphiniums need a soil with plenty of organic matter and good drainage. Make sure your soil is not too clayey or heavily

compacted. To increase drainage, try planting delphiniums in a raised bed or, to escape the fungi, in a totally different area of the garden.

Because you have had this problem for years, it may be time to sterilize the soil. There are two methods to try. The first is a non-chemical way in which you cover the area on the ground with clear plastic for at least one month. This should be done in the spring or summer so that the soil heats up under the plastic and the high temperatures kill a majority of the pathogens. This will not kill all pathogens, but it should kill most of the fungi that cause crown rot. Another method is the traditional, chemical process. Send a soil sample to your extension agent and explain your problems with crown rot. He will analyze the soil, see how severe the problem is, and then advise you as to what chemicals to use to sterilize the soil and how to use them.

Q: I like growing Norfolk Island pines in my house, but I have not been successful with two of them so far and it looks like I might lose my third one. Do you have any suggestions on how to grow these?

—D.M., Dumfries, Virginia

A: The Norfolk Island pine (*Araucaria heterophylla*) is difficult to grow in the home, especially with the advent of central heating. Central heating dries the air and increases the temperature—both of which the pine dislikes. It prefers cool temperatures of about 50° to 60° F and about 50 percent humidity.

Try to place it in a cool place where it will receive moderate to low light and mist the foliage as often as possible. During the growing period, fertilize with a mild liquid fertilizer and water often enough to keep the soil slightly moist. During the winter, withhold the fertilizer and decrease the watering to give it a dry period, but not so dry as to completely desiccate the plant.

—Peggy Lytton
Assistant Editor, Horticulture

Questions in this column are drawn from inquiries we receive on our toll-free Gardener's Information Service hotline. Answers to your gardening problems are one of your AHS member benefits. Call (800) 777-7931.

Mulch Roots for More Roots

From the Morton Arboretum in Lisle, Illinois, comes another inducement to give your trees a heaping dose of mulch.

Previous studies have shown that top growth of mulched trees is more vigorous than that of trees with turf growing close to their trunks. But Dr. Gary W. Watson of the arboretum wanted to see what was happening underground. He experimented on three trees from each of seven different species over a period of six years; areas around the trees' roots were divided into one-meter plots that were either covered with partially composted wood chips or leaves, grown over with grass, or left bare. He mulched every two years, and looked at the results at the end of six years.

In four of the seven species, the amount of fine roots was more than twice as great under the mulch as it was under the turf. These were a red maple, a Norway maple, a sugar maple, and a linden. Two oak trees—a pin oak and a red oak—showed the least benefit from mulch. In the bare soil plots, the red oak showed slightly less fine root growth than it did under turf; the sugar maple had more than twice as much root growth under bare earth, but still not as much as it did under mulch.

Watson notes that although being surrounded by compacted soil or a thirsty lawn is the norm for city trees, in a mature forest they are mulched naturally by layers of deciduous leaves and their companion

plants are non-aggressive. Exactly how mulch works to increase root surface area is still unclear, although it may be related to water access. The moisture content of the soil was highest under the mulch and lowest under the grass. He reported his results in both *The Journal of Arboriculture* and *American Nurseryman*.

A Sour Note

Conscientious about saving water in your garden, you invested in a large pile of mulch this spring and lovingly heaped it around your plants as summer heated up. Not long afterwards, you noticed that they seemed scorched, defoliated, or chlorotic.

Sven Svenson of Texas A&M University and Dr. Willard Witte of the University of Tennessee say that while fertilizer or pesticide misuse is often blamed for such damage, the culprit may be mulch that was improperly stored and has gone sour. Just like compost, organic mulch needs to breathe to keep from becoming anaerobic. When that happens, bacteria and other micro-organisms produce toxic substances such as methanol, ascetic acid, ammonia gas, and hydrogen sulfide. Sour mulch can have a pH in the range of 1.8 to 2.5, they reported in *American Nurseryman*. In such severely acid conditions, sweetening with lime becomes impractical.

It's easy to tell when mulch has gone sour: it will have a sulfurous or ammonia smell quite different from the fresh-cut-wood or sweet compost smell of good mulch.

The problem usually develops when nursery owners or landscapers create large mountains of mulch that become soggy and compressed. But even homeowners with smaller heaps should take steps to prevent souring. Mulch should be stored on a mound that allows drainage, possibly under a roof to protect it against heavy rain, but never under plastic, which will prevent air circulation. A mix of chunky and small particles will help prevent compacting, as will turning it with a garden fork once or twice a month (more often if it is soggy).

Packaged mulch can also go sour, especially if the bags have no air holes. Mulch that has been chemically stabilized will be good for almost a year. But since it's hard to know how long it's been sitting in stacks at the nursery, your safest bet is to use it as soon as possible.

Antsy Grass

If you see ants gamboling about in a bare spot on your lawn, don't blame the insects for the sparse turf. The situation is actually the reverse, says Jeffrey Hahn, entomology educator with the University of Minnesota's Extension Service: ants tend to nest where grass is sparse. You don't have to worry about them making the bald area spread, nor do you have to resort to an insecticide unless you have a pressing picnic date on that very spot. If you can persuade the grass to grow more bountifully in the bare area, the ants should oblige by moving their nest.



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