

# The American GARDENER

The Magazine of the American Horticultural Society

July/August 2003

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The AHS Web site is a valuable source of information about the Society's programs and activities. It is also an important resource for getting the answers to gardening questions, finding out about gardening events in your area, and linking to other useful Web sites. AHS members can reach the members-only section of the Web site by typing in this year's password: **sunflower**.

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## NOTES FROM RIVER FARM

SUMMER IS A special time to share a love of plants and a passion for gardening—not to mention all those extra zucchinis and tomatoes! I have a big family scattered all around America, and each summer I try to catch up with some of them to find out what they are doing. As usual, they are busy planting and growing and sharing the joy of gardening with those around them.

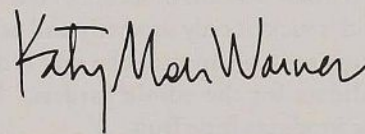
I recently visited my brother, John, who lives in an apartment in New Jersey. He proudly showed me his collection of plants, including the 'Inky Fingers' coleus he had raised from a cutting given to him by our mother. Perched on a window ledge, his plant is growing vigorously and showing the rich burgundy patterning on its leaves that looks like a hand with outstretched fingers. In fact, his plant now looks better than mom's plant. With this increased confidence in his gardening prowess, he's ready to learn how to root a cutting so that he can give one back to her! I guess I will have to send him a copy of our *AHS Plant Propagation*.

My sister Susie lives in upstate New York. She shares her love of gardening and the outdoors with children and is working closely with the local elementary school to create a garden full of beauty and discovery. She is often happily surprised by just how deeply the children are affected by plants and nature. Recently, some of the first graders were helping her plant sunflowers and gourds. In the middle of the project, one of the children stopped, looked up at her, and said, "When I grow up, I want to take care of the earth just like you." She was so touched. She will be coming to the AHS Children and Youth Garden Symposium this July at River Farm, so please join her to share your own successes with children and gardening. She is looking for ideas as well as the opportunity to meet those who share her passion.

My brother-in-law, Tom, grows vegetables in Maine. He has great luck with tomatoes but has found the growing season is generally too short for peppers to be successful. This year, inspired by AHS's The Growing Connection project, he is experimenting by growing peppers in an EarthBox™ and comparing the results with peppers grown in the ground. He is also comparing organic fertilizer with a synthetic chemical fertilizer. So far, the peppers in the EarthBox are winning and the peppers grown with organic fertilizer need less water than the ones fed with a chemical fertilizer. But the summer isn't over yet!

Many of you will also be visiting family and friends this summer and I'm sure you will be sharing similar stories of gardening successes and inspirational moments. After all, summer is the time for plants and gardens. Visit, plant, share, enjoy! And, if you encounter friends or family members who share your love of gardening or are looking for ways to become more involved, give them a gift of membership in the American Horticultural Society. Let's keep them inspired!

Happy gardening!



—Katy Moss Warner, *AHS President*

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## MEMBERS' FORUM

### HERBAL REMEDY

Informing readers about the medicinal properties of plants has much interest and appeal, but I submit that recommending usage for medical problems is not the purview of *The American Gardener*. Carole Ottesen's article on black cohosh in the March/April 2003 issue crossed the line. A major drawback to the Kommission E monographs that she cites is that they do not contain accompanying citations or references to the primary evidence reviewed by the Committee. As such, they only represent opinion, not scientific evidence.

K. Kurt Bofinger, M.D.  
Cincinnati, Ohio

**Carole Ottesen's response:** I am sorry if the article "Herbs in Place of HRT?" gave the impression that *The American Gardener* was recommending use of black cohosh for the symptoms of menopause. As the interrogative title suggests, the article was intended to inform and provoke thought. Being both a lover of plants and plant lore—and as a person for whom HRT was prescribed before the Woman's Health Initiative aborted its study—I felt the information was useful and hoped it would be of interest to others.

### CLOVE CURRANT UPDATE

I was happy to see my all-time favorite shrub, clove currant (*Ribes odoratum*), included in Mary Yee's "Fragrant Spring Shrubs." In my Ann Arbor yard, its ravishing cinnamon fragrance is one of spring's most anticipated pleasures.

But a couple of Yee's comments about this old-time favorite do not jibe with my 18 years of experience of it. She writes that it produces "lots of suckers," but I've found it suckers only modestly and never enough to be a concern. She says it is "a candidate for the edible garden," but mine produces little fruit.

Most importantly, I've read that the USDA no longer considers clove currant an alternate host for white pine blister rust, and so it can be shipped freely throughout

the country. Maybe I'm misinformed, but I'd hate to have outdated information keep anyone from enjoying this easy-to-grow, lavishly fragrant native shrub.

Scott Kuntz  
Old House Gardens  
Ann Arbor, Michigan

**Editor's response:** Clove currants are often confused with—and sold as—golden currants (*R. aureum*). But both species are reputed to sucker and produce fruit freely. Lee Reich, author of *Uncommon Fruits Worthy of Attention*, says clove currant sets fruit best if it's cross pollinated, so you might try buying a second plant.

The federal ban on all currants and gooseberries (*Ribes* spp.) was lifted years ago, according to Reich, "but it's still under state mandate and regulations vary from state to state." The New York legislature voted to repeal that state's ban on currants earlier this year, but the prohibition is still on the books in Maine, Massachusetts, New Jersey, New Hampshire, North Carolina, South Carolina, and Virginia.

### WATERING STUDY

Your recent article in "Gardener's Notebook" (March/April 2003) about Warren and Bilderback's study of afternoon watering demonstrates the importance of empirical testing. Previous explanations of why watering in the morning was best certainly sounded reasonable, but the study's results of 60 to 70 percent better plant growth from afternoon watering are indeed dramatic.

Why, then, does Warren go on to suggest that home gardeners might benefit from switching to afternoon watering, too? His research was focused on containerized plants in the commercial nursery industry, which are usually grown in soilless media that drains rapidly, so it is easy to understand why watering in the mid-afternoon on a hot day can be beneficial. But that does not necessarily mean it will help plants grown in the ground. Most natural soils drain more slowly than containers, and the soil buffers the effect of heat.

I suspect one will not find the same dramatic improvement from afternoon watering for plants in the ground. Moreover, the value of early morning watering is that far less water is lost through evaporation. It may be better, therefore, to continue morning watering for plants that are not in containers. The important point is that we won't really know until someone does the proper studies.

Josh Haskell  
Painesville, Ohio

**Editor's response:** We should have made it clear that the intriguing results of Warren and Bilderback's study are probably only applicable to plants in containers. In this issue, author Ethne Clarke has outlined environmentally sound watering practices in her article, "Waterwise Gardening" (page 48).

### HEUCHERA'S DOGGED BY BEES

I particularly enjoyed Carol Ottesen's "Heuchera Explosion" (March/April). I have been a heuchera fan for many years now, and have been moving my 'Dale's Strain' with me wherever I go.

I would like to put in a good word for those heucheras that may not have showy flowers, especially for those who may be tempted to cut off the flower stalks. Those insignificant flowers attract the most amazing tiny bees! I like to have my morning coffee seated next to a 'Dale's Strain' each flowering season, and enjoy the tiny green jewellike bee visitors.

The other thing I have noted about the heucheras is that our dog, Buford, considers the leaves to be a desirable salad green and will eat them to the ground, with no apparent ill effects.

Sarah Johnson  
Nyack, New York

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**PLEASE WRITE US!** Letters should be addressed to Editor, *The American Gardener*, 7931 East Boulevard Drive, Alexandria, VA 22308, or you can e-mail us at editor@ahs.org. Letters we print may be edited for length and clarity. ☺



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## Garden Conservancy Tours River Farm

DARK CLOUDS and heavy rains didn't dampen the spirits of the Garden Conservancy's Society of Fellows as they toured AHS headquarters on May 8. River Farm was the group's second stop on a tour of Washington, D.C.'s top garden destinations after visiting the White House gardens and before heading to Mt. Vernon for lunch.

AHS president **Katy Moss Warner** greeted the group of more than 50 people before they embarked on a self-guided walking tour of the gardens. Each visitor received a gift bag filled with valuable information and products from AHS national programs. Staff members were available along the tour to talk about the gardens, structures, and SMARTGARDEN™ practices that make AHS one of the premier gardening institutions in the country.

Children's gardening, an important component of AHS's educational initiatives, is supported through the annual Youth Gar-



**Mary Ann Patterson, AHS director of national programs and public relations welcomes Garden Conservancy visitors.**

den Symposium and the Growing Connection, a course designed to teach the science of growing food to middle school students. AHS Children's Garden Program Coordinator **Nancy Busick** and AHS director of National Programs and Public Relations **Mary Ann Patterson** explained these programs as they guided visitors through River Farm's popular Children's Garden.

AHS Special Projects Coordinator **Trish Gibson** offered a presentation on the Green Garage, an exhibit of environmentally friendly gardening tools, that proved to be a big hit with Garden Conservancy visitors, along with the maps they received after **Dr. Marc Cathey's** lecture on the new USDA Plant Hardiness Zone map and the AHS Heat Zone map. Despite the inclement weather, the Garden Conservancy's Society of Fellows was able to get a taste of River Farm's rich history and AHS's promising future.

## AHS Gift Shop Gets Facelift

VISITORS TO RIVER FARM this year have been oohing and aahing over the newly renovated gift shop, which shares space with the AHS Visitor Center. Under the direction of Gift Shop Manager **Marianne Polito**, the gift shop opened this spring under a new "old" name—the Cottage Shop—and has been restocked with a greatly expanded selection of high-quality garden-related merchandise.

Thanks to the assistance of several dedicated AHS volunteers, Marianne—who also manages the AHS Gardener's Information Service and volunteer program—has been able to extend the gift shop's hours



of operation. It is now open from 8:30 a.m. to 5 p.m. on weekdays and during Hort-Takes programs on selected Saturdays during the summer (see box on page 10).

**Laurie Peters**, a member of the Friends of River Farm (FORF) board of directors, played a major role in the renovation of the shop. Laurie, along with Marianne and members of the AHS Horticulture Department staff, spent this past winter refurbishing bookcases and coun-

**AHS volunteer and Friends of River Farm board member Laurie Peters displays some of the popular items in the renovated gift shop.**



## Start Saving Seeds!

Now's the time to start checking your plants to see which ones have seeds ready to harvest and save for the 2003 AHS Annual Free Seed Exchange. Collect and store ripe seeds in a cool, dry place. Then look for the seed exchange information and donor form in the next issue of *The American Gardener*. A seed list will be mailed in January. Members who donate seeds to the program will get first pick.

ters in readiness to display an expanded range of merchandise.

Laurie was also instrumental in developing the theme of the Cottage Shop, "A World of Beauty Through Plants," which is reflected in the diverse inventory of floral-related items from different parts of the world. Some of the more exotic items in the shop are donations from Laurie's personal collection, acquired during the former diplomat's travels around the world. Mouse pads, coffee mugs that "bloom" when hot liquid is poured in them, ceramics, and child-sized watering cans are just a few of the products available for gardeners and non-gardeners alike.

In addition to browsing the assortment of garden-related goods in the shop, visitors can also choose from an extensive selection of AHS books published by Dorling Kindersley (DK), such as the *AHS Encyclopedia of Plants and Flowers*. If you would like to purchase one of the AHS books but can't make it

to the Cottage Shop, you can place an order online by going to [www.ahs.org](http://www.ahs.org) and clicking on the "Books" link.

## AHS Intern Program

OVER THE PAST 20 years, more than 100 promising young people have come through the gates here at River Farm to participate in the AHS Horticultural Internship program.

Whether assisting with the Society's annual Seed Exchange, creating new ornamental borders, or researching stories for *The American Gardener*, interns make countless contributions to AHS programs while gaining valuable experience that serves them well as they move into the professional ranks.

Past AHS interns have gone on to become science teachers, horticulturists, plant curators, landscape designers, research scientists, and even editors. "Our horticultural internship program is playing an important role in building the next generation of horticultural leaders," says **Tom Underwood**, AHS director and curator of gardens and buildings.

The AHS intern program is made possible by donations from AHS members and organizations who believe it is important to invest in the future. Our 2003 AHS Intern appeal is currently underway and we are pleased to be able to offer a special incentive to donors this year: Those who contribute \$64 or more (supporting one day of an internship) will receive a complimentary copy of *Legends in the Garden: Who in the World is Nellie Stevens?* Authored by noted garden writers **Linda L. Copeland** and **Allan M. Armitage**, this fascinating book tells the stories of the people

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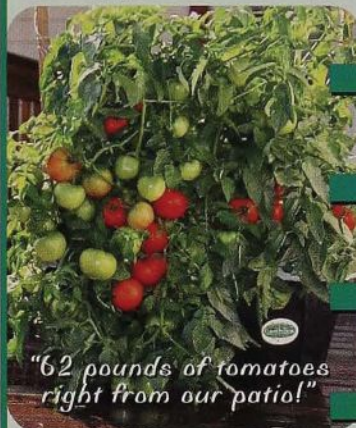
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## Saturday Hort-Takes

AHS's popular "Hort-Takes" series of educational gardening workshops is back. These programs are held rain or shine at 9 a.m. on selected Saturdays through the end of September. See "Regional Happenings," beginning on page 57 for details on upcoming scheduled programs.

whose names are associated with many of our best-known ornamental plants. For a donation of \$320 or more (supporting an intern for one week) you will receive a copy of the book autographed by both Linda and Allan.

For more information and to make a contribution to the special intern appeal fund, please contact **Trish Gibson** at [tgibson@ahs.org](mailto:tgibson@ahs.org) or call her at (800) 777-7931.

## Master Planning the Future

MOVING AHEAD with a new Master Plan for River Farm was the focus of a May planning session hosted by AHS Board Member and landscape architect **Melissa Marshall** at the offices of her firm, Marshall\*Tyler\*Rausch, in Pittsburgh. Members of AHS's River Farm committee used the session to identify important site and programmatic issues that need to be addressed. The Master Plan is expected to be completed by early 2004. Attending the session were **Katy Moss Warner**,



Clockwise from the left: **Katy Moss Warner**, **Joannah Williams**, **Daryl Williams**, **Tom Underwood**, **Melissa Marshall**, and **Ron Kagawa** discuss the River Farm Master Plan during a meeting in May.

AHS president; **Joannah and Daryl Williams**, owners of D & D Tree Farm & Nursery, Inc., in Lake Buena Vista, Florida; **Tom Underwood**, AHS director of gardens and buildings; and **Ron Kagawa**, associate professor in the Department of Landscape Architecture at Virginia Tech's Alexandria Center.

What would you like to see at River Farm? Please send your ideas to Tom at [tunderwood@ahs.org](mailto:tunderwood@ahs.org), and he will share them with the committee.

—*Pia daSilva and Maureen Hartshorn, Editorial Interns*



### Ready, Set, Grow!

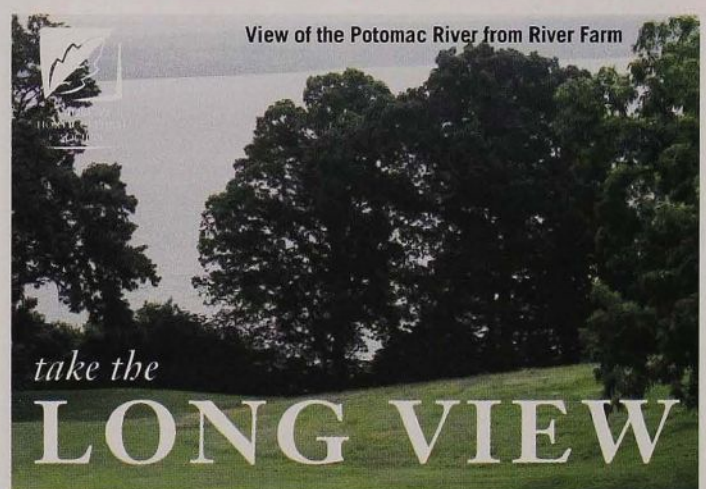
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*Creative learning  
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### View of the Potomac River from River Farm

take the  
**LONG VIEW**

Whether cultivating a sense of wonder in a child, or educating gardeners of all ages to become more environmentally sensitive, AHS and its members are making a difference today. You can ensure we make a difference tomorrow as well.

To become a member of Horticultural Heritage, just notify us that you have named the American Horticultural Society in your will, or otherwise included AHS in your estate plans.

To learn more about how you can support AHS, contact Joe Lamoglia at 7931 East Boulevard Drive, Alexandria, VA 22308-1300, (703) 768-5700 ext. 115.

We urge you to consult with your legal and financial advisors to assist you in arranging the best method of contributing. The American Horticultural Society is tax exempt under Section 501(c)(3) of the Internal Revenue Service Code. Contributions to AHS are tax deductible to the fullest extent allowed by law. AHS is also a registered charitable organization under Section 57-49 of the Virginia Solicitation of Contributions Law; a financial statement is available upon written request from the State Division of Consumer Affairs.



# AHS and MSU Unveil Online Gardening Education Program

by Pia daSilva

WHETHER YOU'RE an experienced horticulturist looking to add to your list of credentials, or a gardening novice who wants to turn your brown thumb green, the Horticulture Gardening Institute's online learning initiative may be for you. The American Horticultural Society (AHS) and the Gardening Institute want to help everyone become a successful gardener, whether their "garden" is acres of land or just an apartment balcony.

AHS and the Gardening Institute, an initiative of Michigan State University (MSU), have joined forces to create an "event-centered, online supported" gardening learning program, which is intended to provide people with educational activities that support the rapidly growing interest in gardening.

Master Gardeners, plant enthusiasts, and gardening groups enrolled in the program can view information from gardening experts online, attend hands-on supporting events, and receive feedback on gardening project plans. "With the educational resources now available, this program makes garden education more accessible at every level," says **Mary Ann Patterson**, AHS director of national programs and public relations. "It has the potential to bring the joy of gardening to millions of people who otherwise might not consider taking a gardening class—including those who, because of physical limitations, can't participate in a standard classroom environment."

## INAUGURAL CLASS

Participants in a container gardening workshop held during Washington Blooms!—AHS's spring festival held this



March—were given a unique opportunity to be part of the inaugural class of this online program, which began on May 10. The first course is titled "The Art and Science of Container Gardening."

The 12-week container gardening program features container gardening projects designed to take four to seven hours to complete. The online activities include interactive games, quizzes to test your skills, and "Garden Radio" interviews of experts and step-by-step instructions for generating project plans. These narrated slide shows can be heard and viewed from most computers equipped with a sound card and Internet access at a cost of only \$70.

Garden Radio interviews for the current session cover topics such as "Hanging Baskets and Floating Gardens" and "Containers for Your Health." Presentations derived from the container gardening workshop held at River Farm include AHS President Emeritus **Dr. H. Marc Cathey's** lecture on combining colorful bedding plants, as well as "Bulbs in Containers" by bulb experts **Brent and Becky Heath**, owners of a specialty bulb business located in Gloucester, Virginia.

This online program will be supplemented by regional events at which participants can utilize the skills learned in online sessions. For the time being, these events will be held at MSU, but eventually a network of Event Partners around the country will serve as hosts.

"This learning opportunity is unique because it integrates the online experience with the ability to attend curriculum-rich events, receive feedback on interactive projects and communicate with other avid gardeners and experts in the field," says **Christine Geith**, co-executive director of the Gardening Institute and director of MSU's Online Global Institute.

All the online activities are self-paced, and attendance at regional events is optional. Upon completion of each program, participants will be awarded a co-branded certificate from AHS and the Gardening Institute stating that they have successfully completed the course.

## UPCOMING PROGRAMS

Next spring, the online classroom will focus on the AHS SMARTGARDEN™ program. Four or five additional classes are under development for the years ahead. These lifelong learning programs, currently being developed through the partnership between AHS and the Gardening Institute, are based primarily on the gardening techniques employed by the horticultural staff here at AHS headquarters at River Farm and at MSU.

Anyone wishing to participate in the Gardening Institute's online initiative can register for the program on the Gardening Institute's Web site (see below). Organizations looking for another way to get involved with the program can become Event Partners. This is a sponsorship opportunity for those who wish to support gardening and horticulture and promote the ways plants can contribute to a better overall lifestyle.

For more information about the program, visit [www.gardeninginstitute.com](http://www.gardeninginstitute.com) or contact **Julie Orlor** at (517) 432-8265, or e-mail [info@gardeninginstitute.com](mailto:info@gardeninginstitute.com).

*Pia daSilva is an editorial intern of The American Gardener*



## A Pioneer in Organic Cuisine

by Carole Ottesen

**N**ORA POUILLON, chef and doyenne of organic cuisine in Washington, D.C., is the recipient of AHS's 2003 Catherine B. Sweeney award, given for extraordinary and dedicated efforts in the field of horticulture. At her restaurants, the eponymous Nora, which opened in 1979, and Asia Nora, which opened in 1994, Pouillon insists on using only quality ingredients grown organically and harvested in season. Associate Editor Carole Ottesen spoke with her about her commitment to organic produce and practices.



### How did you get interested in organics?

What started me was [understanding] the relationship between what we eat and how we feel. It's very important to eat well to feel well. Growing up [in Austria], my parents paid a lot of attention to what we ate, and we were never sick.

When I came here in the '60s, supermarkets looked the same all year around. There were tomatoes all year around, except that they were pink in winter. Lettuce was iceberg. There was hardly any fresh produce available, and it didn't have flavor.

After researching this, I realized it had to do with the agriculture in this country. Everybody used unbelievable amounts of fertilizers, pesticides, fungicides, and hormones. Once you realize all that goes into your food, why would you want to eat it?

### How has the view of organic food changed since you started Restaurant Nora?

In the last 10 years, more and more people and organizations have talked about the connection between the environment and farming. Environmental foundations were created. There is more consumer awareness

of how we exploit nature—the depletion of our oceans and of the nutritive capacity of our topsoil. And there were books like *Our Stolen Future* [by Theo Coburn et al.]—a really good book that didn't get the publicity of the others like *Fast Food Nation* and *The Botany of Desire*.

What had a big impact in the Washington area was the opening of Fresh Fields [now Whole Foods supermarket chain]. Consumers and chefs saw that organic food was going mainstream. That woke them up.

### What kind of problems did you encounter in the early days?

The biggest problem was availability. I couldn't use distributors and wholesalers. Finding the products in the quality and the commercial quantities I needed was difficult. Balsamic vinegar came in tiny little bottles. I begged for three years for a number-10-size can of organic tomatoes!

Finding produce was also difficult. The small farms that grew organically weren't equipped to do deliveries, so I had to pick things up.

And it was difficult to find staff that would do what I wanted them to do. They thought I was crazed. They didn't want to order from farmers because the produce was dirty—or had holes from bug bites.

### Is organic food more available now?

As organic food became more mainstream, I could get things from Europe. Now I get olive oil in 70-gallon drums from Spain and 2½-gallon containers of balsamic vinegar from Italy. Organic cheeses come from France and Italy. Olives come from California; grains, nuts, beans, coffee, sugar, and chocolate come from local distributors.

### It still sounds difficult to find all of the different products you need. Is it?

It's very labor-intensive. I have a person

who handles the process because it's so complicated. We helped to organize a co-op of 30-plus Amish and Mennonite farmers who deliver two times a week—and in summer three times a week—produce and tiny little greens, berries, herbs. There are three Amish farmers who raise our pigs, lambs, and chickens. And we get organic beef from Sunnyside Farms in Washington, Virginia.

### You also serve produce only in season. Is that a hard and fast rule?

That's the only way you can do it. If it's not in season, it's outrageously expensive. In our area, you *can* grow some things all year around—lettuce, Belgian endives, mâche. It's just that people have lost interest in doing that. So farmers have, too.

### You and your family travel a great deal. Does sampling foreign fare affect your menu planning?

First of all, the menu at Restaurant Nora is new American cuisine—a hodgepodge of all cultures and influences. That's what America is to me. When I travel, I just absorb how the local people do things, how they mix spices, what the flavor profile is. We go to markets and restaurants more than we go to museums.

### You said once that you would like to start a chain of organic fast-food restaurants. Is that idea still intriguing?

I've been saying it for 10 years or more. I've even put menus together. You would need a lot of money to grow, to contact the farmers, to secure prime real estate, money to do a commissary. And you need locations in good areas; think about Starbucks. It would have to be done by someone really committed to organics, to people—and someone who doesn't mind losing a couple of million. Running a restaurant is like playing the lottery. And doing it organically is another risk factor.

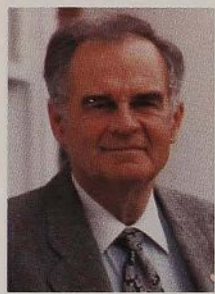


## Zones Clarify Plant Categories

by Dr. H. Marc Cathey

IT WAS PEDANIUS DIOSCORIDES, a Greek physician working in Rome nearly two millenia ago, who first outlined the basic categories—annuals, herbaceous perennials, shrubs, vines, and trees—we have traditionally used to classify plants. But in studying the plants growing around him, Dioscorides considered

only how they performed in the climate of Rome. He did not take into account that many of the plants he observed had found



their way to Rome from elsewhere in the Roman Empire—which at that time stretched from the frigid Alps to the tropics—and thus might exhibit different growth habits under differ-

ent climatic conditions.

Since the time of Dioscorides, horticulturists have coined a variety of terms to distinguish between plants that are “true” annuals—those that complete their life cycle and die in a year or less no matter where they are grown—and plants that survive and thrive only in frost-free areas. Among the terms in common usage are half-hardy annuals, hardy annuals, and tender perennials. These terms may be helpful to gardeners who live in areas where the climate is relatively consistent, such as the British Isles, but they are not meaningful when applied across a broad range of climatic zones such as we have in the United States.

One example that exposes the shortcomings of such terms is the lantana (*Lantana camara*). In northern climates, it can be grown outdoors only over the summer, so it is sometimes categorized or used as an annual. But in areas where winters are mild, it is root hardy and will act more like an herbaceous perennial—even if the above-ground portion of the plant is killed by frost, new sprouts usually emerge from the ground in spring. Thus it is also referred to as a tender perennial. And in frost-free areas, lantanas will grow and

flower continuously, becoming woody and assuming a shrubby or even treelike habit over time.

### CODING IS THE SOLUTION

One of the major benefits of the newly revised USDA Plant Hardiness Zone Map is that, used in combination with the AHS Plant Heat Zone Map, we can now code plants in a manner that will give gardeners a more accurate picture of their growing requirements. In this way, our understanding of plant growth habits no longer need be constrained by the rigid classifications and terminologies we have used in the past.



**Tropical plants such as *Lantana* ‘Lucky Peach Sunrise’ can now be more accurately categorized by hardiness and heat zones.**

Through a system I devised, plants can now be quantified with four codes—two for hardiness and two for heat tolerance. The first two numbers in the series identify the winter range from the coldest to the least cold zone in which the plant can thrive. Numbers three and four in the series identify the range of summer toler-

ances of plants from the zone with most “heat” days (days when temperatures rise above 86 degrees Fahrenheit) to the zone with least heat days.

Thus the lantana can now be coded 11–15, 12–1. The first number indicates that the plant will not reliably survive the winter in a region cooler than USDA Zone 11. The second number indicates that it will thrive into USDA Zone 15. The third number indicates it will thrive in the warmest heat zone (AHS Zone 12); and the fourth number tells us that it will grow and flower successfully in the least-warm heat zone and all the others in between.

The four-number zone code offers tremendous benefits and potential applications not only for gardeners, but for ecologists, foresters, and farmers. To make it easier for everyone to use this new tool, the hardiness and heat maps are digitalized, and growing zones can be easily identified through an index searchable by postal zip codes (available on the AHS Web site [www.ahs.org](http://www.ahs.org)). No matter where you live, you can now use these codes to help select the plants best suited to the expected winter and summer temperatures in your region. You will see the codes listed with plants described in each issue of *The American Gardener*.

I encourage gardeners around the country to help us refine and improve the coding system by observing plants in their gardens and reporting any apparent inconsistencies. The coding is, after all, a work in progress. The improved precision that can be achieved through shared observations can only lead to a better understanding of plant growth.

*Dr. H. Marc Cathey is AHS president emeritus.*



## Gardens and Monuments of India

Article and photographs by Maryalice Koehne

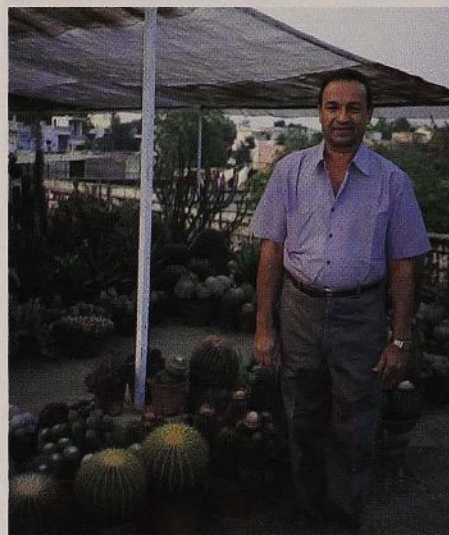
**M**ANY CULTURES and gardening legacies meet in India, so it's no wonder its gardens, monuments, and traditions are as rich and varied as any on earth. Visiting northwestern India while on the American Horticultural Society's Travel Study Program last November was an unforgettable experience for me and 12 other participants who enjoyed camaraderie, luxurious accommodations in former palaces, and delightful local cuisine.

Among the group's favorite gardens were those created in the paradise tradition during the Mughal dynasty (1526–1858), most notably the formal raised gardens designed in the *charbagh* system (four-part garden) intersected in the center by water channels representing the four rivers of life. To the Mughals, who invaded India from the north in the 1500s and ruled it for centuries, water was a key element in garden design. Examples of Mughal gardens can be seen at Humayan's Tomb in Delhi and the world-famous Taj Mahal in Agra.

Our group also visited a variety of private gardens ranging from contemporary urban rooftop oases to English-style perennial borders at country homes and hotels—the legacy of 19th- and early 20th-century English rule. We even strolled through the Ayurvedic (medicinal herb) garden at Benares Hindu University and visited Deer Park in Sarnath, where Prince Siddhartha (Buddha) is said to have gained enlightenment 2,500 years ago as he sat under a Bodhi tree.

### REDISCOVERING INDIA'S GARDENING PAST

Because of the altering effects of time, weather, and British rule, the plantings in the Mughal gardens lay no claim to historical accuracy. Ironically, interest in preserving India's buildings and gardens didn't exist until the late 1800s, when Englishmen such as Lord George Curzon, Viceroy of India from 1898 to 1905, realized that artistic and historic treasures were being lost. More recently, the Aga Khan, the spiritual leader of a branch of Shiite Islam, paid for the ongoing restoration of the gardens at Humayan's Tomb, India's first great imperial tomb that also in-



**Above:** A Mughal-style garden in the women's quarters at the old palace at Amber, Jaipur. **Left:** Plant hobbyist K. K. Agrawal at his Jaipur rooftop garden where he grows an enormous collection of succulents in containers.

spired the architecture of the Taj Mahal.

The Taj is unusual because the monument is at the end of a garden, whereas Mughal gardens usually feature a pavilion in the middle—at the intersection of the water channels. Tomb gardens like the Taj

have been better preserved than pleasure gardens like the Moonlight Garden (Mahtab Bagh) across the Yamuna River because they were left in the care of priests.

Documentation of pre-British plantings in many of India's gardens has been slow in coming. In 1995, David L. Lentz, the first paleoethnobotanist to work at a Mughal garden site, discovered plants indigenous to India at the site of the Moonlight Garden. Other ongoing research by garden historians centers on Mughal-era literature, which includes references to fruit trees like figs, dates, mangos, almonds, and pomegranates, as well as flowers such as violets, oleanders, and zinnias.



## A ROOFTOP FOR SUCCULENTS

In addition to the grand public gardens, the AHS group toured large estate gardens and city gardens on rooftops and balconies. The gem of the private gardens was the Jaipur rooftop garden of K.K. Agrawal, a jeweler and designer, who maintains the largest collection of living rocks (*Lithops* spp.) in India. "Lithops are easy to grow from seeds if you are patient," he explains. "In a year's time, a seedling will be only the size of a pea." His patience has rewarded him tenfold. "I often spend an hour a day admiring them," says Agrawal.

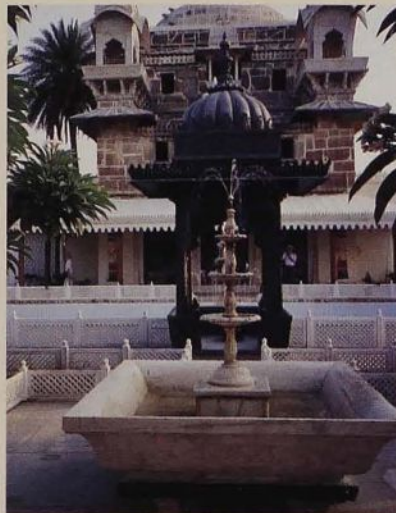
His rooftop collection also includes 789 species of cacti, 101 euphorbias, and hundreds of other succulents—all grown in pots. A wire-mesh screen shields the plants from intense sunlight, wind, and hail. (You can see photos of his collection at [www.macro-designs.com](http://www.macro-designs.com).)

After visiting so many memorable gardens in India, the AHS tour participants had only one question at the conclusion of the trip: "When can we return?"

*Maryalice Koehne is a free-lance writer living in Wauwatosa, Wisconsin.*

## Turning to Natives to Cope with Water Shortages

At the time of the AHS Travel Study trip in November 2002, the areas visited were in the midst of a seven-year drought, so many of the water features in the gardens were dry. The effect of prolonged drought was starkly illustrated by the eerie quiet of the beautiful but deserted city of Fatehpur Sikri, built in the late 1500s and later abandoned for lack of water.



A fountain at a former imperial retreat on the island of Jag Mandir.

Historically, droughts have caused widespread starvation in India, but a columnist for *The Times of India New Delhi* wrote in November 2002 that the country is much better prepared now than in 1979, when it experienced what he called "the last of the truly traumatic droughts." He attributed this progress in part to the country's embracing a "green revolution."

Adds S.K. Mathur Kumar, director of horticulture for the Oberoi Group of hotels, "The concept of using native plants that are drought resistant and adapted to local conditions is catching up fast since the shortage of water is on the increase and the adoption of native plants is becoming a *must* for gardens to exist."

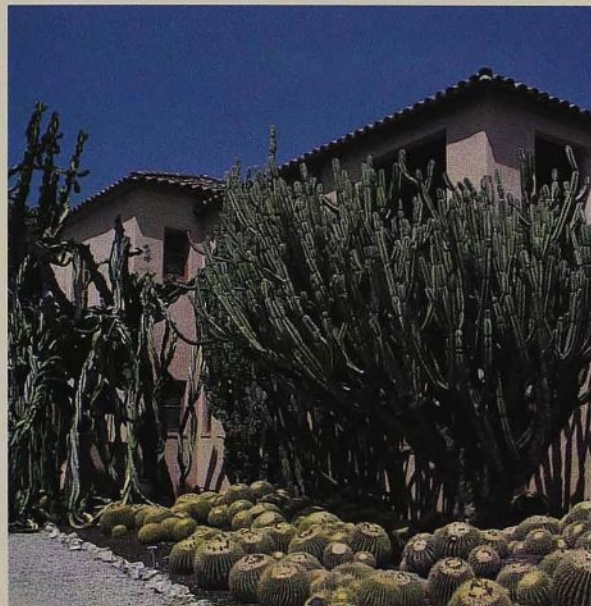
—M.K.



2003 American Horticultural Society TRAVEL STUDY PROGRAM

## Gardens of Santa Barbara

October 28–November 2, 2003



Through visits to an astonishing variety of garden styles, travelers to the gardens of Santa Barbara will view firsthand the exceptional range of trees, shrubs, perennials, and annuals that can be grown in this beautiful city by the ocean. Best described as a Mediterranean climate, Santa Barbara's environment can boast of world-class gardens. Starting with the lush grounds of the host hotel, Four Seasons Biltmore, this travel study tour includes fantastic garden themes and collections, from striking contemporary designs to tropicals and subtropicals, California natives, and Ganna Walska's famed Lotusland.

Patrick Anderson of Fallbrook, California, will be hosting this tour. A long-standing member of the American Horticultural Society, he has an extensive knowledge of plants and a keen interest in California gardens. His own garden has been featured on the PBS series "Victory Garden." It is through his personal contacts that many of these visits have been made possible.

For complete details of the exciting 2003 schedule, visit the AHS Web site at [www.ahs.org](http://www.ahs.org), or call the Leonard Haertter Travel Company at (800) 942-6666.

No member dues are used to support the Travel Study Program.



# SMARTGARDEN™ — Harnessing Solar Power

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Solar energy can be captured and stored during the day to run small recirculating fountains or illuminate our garden paths at night with solar powered light fixtures. Greenhouses, which depend on the sun for heat during the day, can be outfitted with collectors that hold the sun's heat to temper cold nights.

The Cheyenne Botanic Gardens in Cheyenne, Wyoming, which has pioneered many techniques in solar greenhouse gardening, operates a conservatory that is heated using only solar energy: The passive solar heating system supplies 100 percent of the heat to three separate 28-foot-by-45-foot greenhouse sections. Additionally, the photovoltaic system generates 30 to 50 percent of the Botanic Gardens' other electrical needs, including the paddle fans, irrigation controls, lights, computers, and office equipment.

## KILLING WEEDS AND DISEASES

Soil solarization traps the sun's heat beneath a plastic covering, raising the soil temperature beneath the plastic to a level that reduces or kills many weeds, plant parasitic nematodes, and disease causing microorganisms. It is an economically viable and environmentally friendly alternative to pesticides, particularly soil fumigants. The U.S. Environmental Protection Agency (EPA) cites a benefit beyond solarization's immediate control of weeds and diseases. It has also been shown to increase crop yields.

Soil solarization should be done during the warmest, sunniest part of the year. Depending on location and weather conditions, it generally takes four to eight weeks. That means the bed being treated is out of commission during this time—the only drawback to the technique. The benefits of weed and disease control, higher crop yields, and reduced need for pesticides, however, generally outweigh the inconvenience.

The degree of control achieved by solarization de-

pends on the particular weeds and diseases present, and the level, duration, and depth of the elevated soil temperatures. Beds should be at least two-and-a-half feet wide; sufficient heat build-up for effective weed and disease control is difficult to attain in narrower beds.

Solarization is more successful in controlling annual weeds than perennial weeds, although growth of the latter is often suppressed. Studies at Louisiana State University have demonstrated that solarization offers effective control of such common weeds as goosegrass, annual bluegrass, annual sedges, and crabgrass, among others.

Solarization may be the best available control for many plant-infecting nematodes—wormlike microscopic soil organisms. Species that cause significant damage to a wide range of plants,

including root knot, lesion, and cyst nematodes, are among those effectively controlled by solarization. The bacteria and fungi responsible for diseases such as crown gall, fusarium and verticillium wilts, phytophthora root rot, and many others are killed by solarization. Populations of other disease-causing microbes are often reduced to non-damaging levels.

## PROCEDURE

Before spreading the plastic over the soil surface, prepare

the bed for post-solarization planting to minimize soil disturbance after treatment, which can recontaminate the soil. Cultivate, removing clumps of weeds, and add soil amendments such as lime and compost if necessary. Rake the surface smooth to ensure close contact between the soil and plastic, and water to a depth of 12 inches. This stimulates germination of weed seeds and the activity of disease causing organisms, making them more vulnerable to destruction by heat. The moisture also helps conduct the heat through the soil.

Clear polyethylene is preferred because it permits more heat to pass through it and enter the soil; black or colored plastics tend to absorb heat. Although thinner plastic (one to two mil) allows more heat to penetrate, it tears easily. Thicker plastic (two to four mil) is sturdier, and can often be reused. To increase effectiveness, a second layer of plastic can be placed over the first, using blocks of wood



While black plastic absorbs the sun's heat, clear plastic is preferred for solarization because it allows more of the sun's heat to penetrate the soil and kill weeds.



or empty soda cans as spacers. Air trapped between the layers helps prevent soil heat from escaping.

Dig a six- to eight-inch trench around the bed and cut the plastic so that it will extend beyond the bed by about 18 inches on all sides. Place it over the bed, smoothing out air pockets, stretching it as you go to keep it taut, and burying the edges in the prepared trench. If the bed is large, you can further secure the plastic by weighting it with smooth stones or small plastic bags filled with sand.

To kill harmful pests and weeds, the top six inches of soil need to reach a temperature of at least 110 to 125 degrees Fahrenheit and maintain that temperature for several weeks. To monitor temperatures, place one or more soil thermometers under the plastic, inserting the probe about five inches deep. At least four to six weeks is generally recommended for solarization, although greater control may be possible with longer treatment, as long as warm temperatures and sunny skies prevail.

When removing the plastic and planting the bed, avoid disturbing the soil too much. Bringing to the surface soil from below the level that was solarized can reintroduce weed seeds or disease-causing organisms.

#### SOLARIZING POTTING SOIL

Extension plant pathologist Tony Keinath of Clemson University recommends another application of solariza-

tion: to disinfest potting soil. Moist, pre-used potting soil should be sealed in clear plastic bags, one gallon size or larger, and placed in a sunny location on a cement surface for three or four weeks, turning the bags halfway through the treatment. Because the volume of soil is limited in this case, solarization can be extremely effective.

#### ADDED BENEFITS

Interestingly, many researchers have found that plants grown in solarized soil perform even better than might be expected simply from the reduction in weed and disease organisms. Beneficial soil microbes are apparently more heat tolerant than those responsible for diseases, and often increase in numbers after solarization, partly the result of reduced competition from destructive species. Researchers term this a "microbial shift," and in this case, it works to the crop's advantage. Another theory for the improved performance and increased yields that follow solarization is the heat-induced release of soluble mineral nutrients from organic matter and heat killed microbes.

Furthermore, the effective control of many diseases and weeds using solar heat reduces the need for chemical pesticides.

*Rita Pelczar, Associate Editor*

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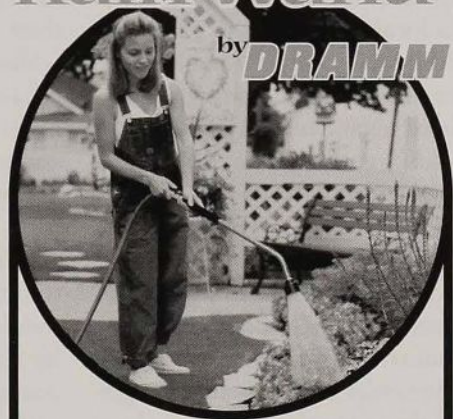
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## Side Dish

by JoeAnn Hart

**Dragon Langerie** (57 days). Also known as *Dragon's Tongue*, this heirloom from the Netherlands is as tasty as it is attractive. Its compact stocky bushes bear abundant creamy yellow beans mottled with purple tiger stripes. A prolific producer of flat 6" pods that are crisp, stringless and amazingly juicy when eaten fresh. —Fedco Seed Catalog

IN MARCH I searched through catalogs for a vegetable that screams “Your hostess cares” to serve at a benefit dinner party at the end of July. ‘Dragon Langerie’ bean sounded properly dramatic, so I ordered the seeds and wrote it down on the menu.

You are already thinking this story is not going to end well. But I believed I could plant with a specific dinner in mind without offending the gardening gods because my ambition was for the greater good of a local social services organization—although, in my mind, I entertained exchanges with guests as they rhapsodized over the beans (“purple stripes!”) as I spooned them onto the white rental plates. “Oh, these? ‘Dragon Langeries’? Where did I buy them? Oh, no—ha, ha—I grew them.”

Such hubris. When things went wrong—and they did—I had only myself to blame for overgardening.

On Memorial Day I double-dug a space for those speckled beans before building a six-foot-by-six-foot raised bed with layers of seaweed, wood ash, compost, and rotted manure. I pressed the glossy beans, beautiful as designer buttons, into the soil a week early to allow for cooler coastal conditions, for I planned to pick the beans on the morning of the party.

I also planted regular beans for family consumption in a bed scratched out in marginal soil at the other end of the garden, as if my new beans were too good to be anywhere near them. They were my stalwarts: ‘Jade’, a green bush bean, and



‘Golden Rocky’, a yellow wax, plus some ‘Royalty Purple Pods’ for nibbling raw, since the purple turns green under heat. All these commoners I planted and ignored.

But the ‘Dragon Langerie’ bed I weeded, I watered, and I fertilized with manure tea to encourage the unfolding voluptuousness of the leaves. I created optimum conditions for the plants, and that’s just what I got: Gorgeous plants.

They were big, lush—and in no rush to put out flowers and set beans. I had coddled them with nitrogen, which is fine for leafy plants such as spinach, but not if your goal is the flower or fruit. Like young adults who won’t leave the comforts of home, the beans refused to mature. I understood this basic plant science but had chosen to disregard it.

I spent an anxious two weeks before the party watching the lackadaisical purple-and-white flowers pop open here and there. The week before the party, the plants set teeny crescent beans. The day before the party, there was a smattering of half-grown, yet spectacular looking, purple-striped beans.

As if my disgrace were not complete, the beans I had planted for the family were

in full production. The poor plain things had raced to maturity in order to produce progeny before I killed them with neglect. So for the party I served ‘Green Jade’ and ‘Golden Rocky’; I steamed the ‘Royalty Purple Pods’ along with them, but of course they turned green with the heat.

One week after the party, the raised bed exploded with plump ‘Dragon Langerie’. I gave them away to neighbors by the gallon bag. Their beauty was heart-breaking, and I wanted none of it.

But by the end of their production a couple of weeks later, I relented. The mid-season beets were ready, and I had a recipe for a beet-and-bean salad. The purple-and-yellow beans would be pretty, I thought, with the deep red beets and white feta cheese. I would swallow my pride along with my mistakes.

I lowered the striped beauties in the boiling water to blanch, then lifted them out. I gasped. *They were plain yellow beans.* Just as with the ‘Royalty Purple Pods’, the color disappeared with heat. They looked like the ‘Golden Rocky’ beans I had served at the party in such despair. Even if the ‘Dragon Langerie’ had ripened in time, the results would have been the same.

I was ashamed that for these superficial legumes I had scorned my reliable old bean friends. The seed catalog *could* have mentioned that the beans would lose their distinctive color after cooking, but I already knew that. Purple in beans is ephemeral, like so much else in life. It was just another season in the garden, where every year we have a chance to learn—and every year we choose fantasy over reality.

*JoeAnn Hart is a free-lance writer living in Gloucester, Massachusetts.*



### Our Experts Answer Your Gardening Questions

#### CONTROLLING ROOT WEEVILS

I recently lost several foamflowers (*Tiarella* spp.). Their roots appeared to have been severed from the upper part of the plant, right at the crown. When I dug in the soil, I found numerous small white grubs. What are these grubs and how do I treat them?

—N.E., SILVER SPRING, MARYLAND

The likely cause is one of several species of root weevils that plague a wide variety of ornamental plants. The larvae, which you discovered, are typically under a half inch long, white with tan heads, and a C-shaped body. The black, brown, or reddish colored adult beetles—which appear to have long “snouts”—usually emerge in summer and feed on foliage. But it's the larvae that do the more serious damage by eating the roots and crown of plants.

Control is usually most effective if you spray the adult beetles with synthetic pyrethroids in the evening when you see them feeding. You can also drench the soil in fall or spring to control the larvae.

Dan Heims, co-owner of Terra Nova Nurseries, a wholesale nursery that has introduced several new varieties of foamflowers, says that a drench of very hot water is an organic option for killing the grubs. For more information about the root weevil, see the Terra Nova Growing Tip online at: [www.terranovanurseries.com/news/PreviousGrowTips.htm#Root%20Weevils](http://www.terranovanurseries.com/news/PreviousGrowTips.htm#Root%20Weevils).

#### ELIMINATING BERMUDAGRASS

What is the most effective way to remove wiregrass from a bed of 10-year-old azaleas? The wiregrass has crept in from an adjacent lawn area and is deeply entrenched at the base of each azalea. I have hand-pulled the tops of the wiregrass, but can't get to the roots. Is there a way to eradicate it without damaging the azaleas?

—J.T., GREENVILLE, SOUTH CAROLINA

Several grasses are known by the name

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“wiregrass”; the most common are goosegrass (*Eleusine indica*) and Bermudagrass (*Cynodon dactylon*). Since goosegrass is relatively easy to pull up, your problem is probably Bermudagrass, which grows very long, deep roots and is almost impossible to pull up completely. Even a small piece of root left in the soil can generate a new plant.

In your case, it is probably best to use a non-selective herbicide that contains glyphosate to kill all the grass around the azaleas. To be most effective, the herbicide should be applied while the grass is actively growing. Since Bermudagrass goes dormant in most areas in the late fall, it is best to treat in early to mid-summer. Be sure to keep the herbicide from coming in contact with the foliage of the azaleas and, as with any pesticide, read and follow the instructions carefully before using.

It may take more than one application of herbicide to kill the Bermudagrass, but it will eventually die. Then install continuous metal or plastic edging around your azaleas to prevent the wiregrass from creeping back into the bed.

#### IRIS CLARIFICATION

What is the difference between *Iris pumila* and dwarf or intermediate bearded iris?

—R.W., LEXINGTON, KENTUCKY

*Iris pumila* is a species of iris; it has not been hybridized or bred for any particular trait. Dwarf bearded irises are the result of hybridizing *Iris pumila* and one or more other species of bearded iris to form a more compact, cold tolerant plant. Although dwarf bearded iris cultivars are often sold

under the name *Iris pumila*, they are usually hybrids of two or more species.

#### NON-BLOOMING ORCHID CACTUS

A couple of years ago I purchased a red orchid cactus (*Epiphyllum* sp.) and it has grown well and is now a good size plant, but it has yet to flower. Is there any special kind of treatment to get it to flower or will it just do it on its own?

—A.J., FLORENCE, KANSAS

There are several possible causes for your plant's reluctance to bloom. Epiphyllum Society of America board member Pat Dobbins, who grows over 1,200 different epiphyllums at Epie Acres in Placentia, California, explains that any epiphyllum “has to have its roots crowded before it blooms. The most common mistake beginners make is putting it in too large of a pot.” She suggests that if you think this is the case, you should repot it in a smaller container.

Another possible cause of non-flowering is light: Epiphyllums are short-day plants—they require a certain length of darkness to initiate flower buds. The length of darkness your plant receives indoors should correspond with the length of the natural dark period outdoors. If it is in a room where lights are turned on in the evening, the requirement for initiating flower buds will not be met. Even a few minutes of light interrupting the dark period can prevent flowering.

Finally, your cactus may simply be too young to produce buds. All plants go through a juvenile stage of mostly vegetative growth before entering the adult stage where flowers and seeds are produced. Dobbins says that it may take three to four years before it reaches full blooming size, so it may just be a matter of time.

*William May, Gardener's Information Service Volunteer, and Marianne Polito, Gardener's Information Service Manager.*



# Horticultural News and Research Important to American Gardeners

## Garden-Worthy Artemisias

Among the estimated 300 species of the genus *Artemisia* are a number of ornamentals prized by gardeners for their aromatic, silvery foliage. In order to determine the best artemisias for Midwest gardens, Richard G. Hawke, manager of the Chicago Botanic Garden's (CBG) Plant Evaluation Programs tested 26 perennial species and hybrids in a four-year comparative study.

Plants in the CBG study were rated for habit, health, cultural adaptability, and susceptibility to winter injury. Eighteen of the original 26 taxa survived all four years. Of these, only six received the highest four-star rating for superior performance. These are *Artemisia absinthium* 'Lambrook Silver', *A. alba*, *A. lactiflora*, *A. lactiflora* 'Guizhou', *A. ludoviciana* 'Valerie Finnis', and *A. schmidtiana* 'Silver Mound'. Even the highly rated plants were not completely immune to weather and less-than-perfect site conditions.

At CBG, the test subjects were planted in well-drained, compost-enriched clay loam with a pH of 7.4 in a site that received approximately 10 hours of full sun during the growing season. A weed-suppressing mulch of shredded leaves

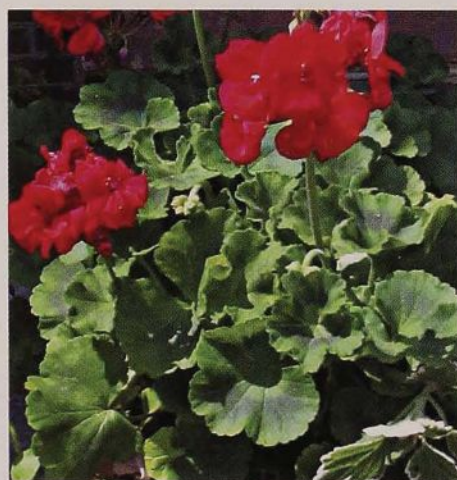
and wood chips was applied between plants and hemlock boughs were placed over them in early November to protect the artemisias in Chicago's chilly climate (USDA Plant Hardiness Zone 6, AHS Plant Heat Zone 5). Otherwise, maintenance practices were kept to a minimum to simulate typical home garden culture.

Not surprisingly, as artemisias often hail from dry climates, many taxa proved sensitive to excessive humidity and moisture. "Silver-leaved artemisias are particularly troubled by wet soils," says Hawke. "High humidity and heavy rainfall contribute to crown melt-out in summer months and soggy winter soils can lead to root rot or even the death of the plant. A well-drained soil is the best prevention against moisture issues that affect artemisias."

The complete results of the artemisia study are published in the CBG's Plant Evaluation Notes, Issue 19, titled "Garden-Worthy Artemisias." To obtain a copy, send a check for \$3 payable to CBG to: Plant Evaluation Notes, c/o Richard Hawke, Chicago Botanic Garden, 1000 Lake Cook Road, Glencoe, IL 60022.



***Artemisia ludoviciana* 'Valerie Finnis' performed well in a four-year study at the Chicago Botanic Garden.**



## BIOTERRORISM REGULATIONS INVOKED FOR PELARGONIUM DISEASE

Commercial growers of annual bedding geraniums (*Pelargonium* spp.) endured quarantines earlier this year when stricter regulations put in place to prevent bioterrorism were invoked to quell an outbreak of a prohibited strain of a fungal disease known as southern bacterial wilt.

Bedding geraniums have an unfortunate susceptibility to southern bacterial wilt (*Ralstonia solanacearum*), which is also a serious disease of agricultural crops—especially potatoes. One particular strain of the disease, known as *R.*

*solanacearum* race 3 biovar 2, was included on a list of Select Agents and Toxins prohibited under the U. S. Department of Agriculture's Agricultural Bioterrorism Act of 2002.

In late 2002, cuttings of geraniums at Goldsmith Plants' Kenya facility infected with the prohibited *Ralstonia* strain were inadvertently shipped along with other cuttings to greenhouses in Michigan and New Hampshire. From there, the cuttings were circulated to other growers throughout the country. Subse-



quently, growers began noticing wilting symptoms among the plants. The severity of the problem was not recognized at first, because early symptoms of *Ralstonia* resemble those typical of bacterial blight, another fungal disease that plagues geraniums. Ultimately, the disease was correctly diagnosed, and by May 2003, 127 cases had been identified in 27 states. In cooperation with USDA, Goldsmith Plants voluntarily quarantined two stock houses in Kenya and it and other affected growers have destroyed hundreds of thousands of cuttings.

Quarantined nurseries had to wait for an agent of USDA's Animal and Plant Health Inspection Service to give them a clean bill of health. In the interim, they could not sell, groom, or take cuttings from any bedding geraniums. If infected plants were found, they were destroyed under strict quarantine protocol.

Richard Goldsmith, president of Goldsmith Plants, estimated the industry's losses because of the quarantines and plant destruction as "in the millions." To help offset these losses, Goldsmith and other affected growers are seeking USDA com-

penensation. "Given the heightened emphasis on national security, we understand why USDA had done what it has done," says Goldsmith, "but it has caused an excessive financial burden and we would like to ensure the growers involved receive fair compensation."

Goldsmith says his company and other growers are also working closely with USDA to set up more effective protocols for plant production. "It has been a big learning curve for all of us and we need to work together to find ways to ensure there is less chance of disease in our plant products," he says.

### FROG MUTATIONS LINKED TO HERBICIDE EXPOSURE

Atrazine, the most widely-used herbicide in the United States, may cause sexual abnormalities in frogs, according to Berkeley professor of endocrinology Tyrone Hayes and several colleagues. Their abstract in the *Proceedings of the National Academy of Science*, states that "at exposure levels 10,000-30,000 times beneath levels previously identified as non-toxic to frogs," frogs matured into

demasculinized adults, often with "multiple, mixed gonads."

Atrazine has been banned in most of western Europe, including Switzerland, the location of Syngenta AG, one of the world's largest producers of the chemical.

In the United States, an estimated 75 million pounds of atrazine is applied annually because it is cheap, long-lasting, and effective against both grasses and broadleaf weeds. It is particularly valued for use on corn crops because it kills weeds while, almost miraculously, leaving corn unharmed.

In 1992, after atrazine from agricultural runoff and manufacturing facilities was found in surface and ground water in the United States, the Environmental Protection Agency (EPA) limited the amount of contaminants allowed in public water supplies—the Maximum Contaminant Level (MCL)—to 0.3 parts per billion. More recently, in light of some of the new studies linking atrazine contamination to mutations in frogs and other amphibians, "new guidelines have been set for communities that are showing high risk for in ground water systems,"

## share **THE GROWING CONNECTION**

Along with several other partners, AHS and the Food and Agriculture Organization of the United Nations have launched The Growing Connection, a project designed to teach children around the world about the science behind growing food plants. Ten schools in the United States and ten schools in the West African nation Ghana will be the first growing connection.

The Growing Connection Kit contains everything a school needs to get started growing these special vegetable seeds, including project sheets that will provide directions for experimenting with the seeds that went up in a NASA science balloon.

Buy a kit for the program and your gift will be matched by EarthBox. For every three kits purchased, EarthBox will donate an additional kit. You can also make a tax-deductible gift in any amount to the program. To order or make a gift, visit the AHS Web site at [www.ahs.org](http://www.ahs.org) or call AHS at (800) 777-7931.



#### Your Growing Connection Kit includes:

- 26 Seed Packets (13 that were launched into space aboard the NASA balloon), including fun vegetable varieties and beautiful sunflowers
- 1 bag soilless mix
- Fertilizer and dolomite
- Project sheets
- 1 EarthBox

AHS would like to thank the many partners who share the vision of The Growing Connection: Food and Agriculture Organization of the United Nations, National Aeronautics and Space Administration Balloon Program office, EarthBox, Rockland Teachers' Center Institute, Ball Horticultural Company, Benary, Thompson & Morgan, Seeds2000, American Takii, the governments of Ghana and China, the Pennsylvania State University, Michigan State University, and the African Development Bank.



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6 BULBS TO START THEM VIGOROUSLY, Beating Soil-rot, Hastening Better BLOOMING	7 SEEDS To Help GERMINATION Percentage and SPEED EARLIER, BETTER YIELDS, including Vegetables	8 LAWNs To Make QUICKER, deeper, TOUGHER TURF from SEED, SOD, Stolons, Sprigs, HYDRO-seeding	9 11 XMAS TREES 12 REFORESTATION 13 HYDROPONICS 14 FIELD CROPS 15 BONSAI 16 TISSUE CULTURE	10 17 HYDROSEEDING 18 LANDSCAPING 19 PROPAGATION 20 ANTI-EROSION 21 ENVIRONMENTAL IMPROVEMENT
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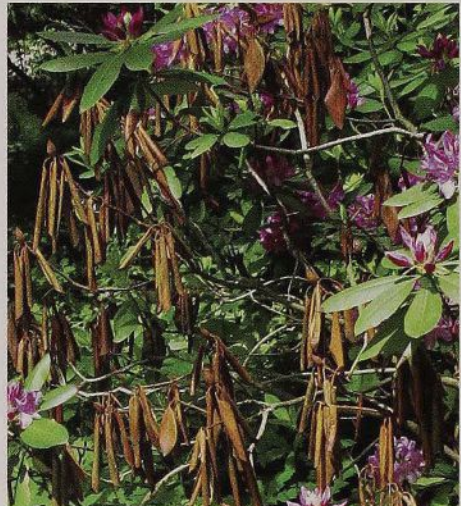
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says EPA spokesman David Deegen. If testing shows higher than acceptable levels of atrazine in a watershed, using it will be prohibited in that area.

## RHODODENDRON ROT

When high humidity, warm temperatures, and water-logged clay soil come together, rhododendrons can succumb to root rot, a systemic disease caused by a fungus, *Phytophthora cinnamomi*. The first symptoms are yellowing of leaves—usually in only one part of the plant. New leaves may be dwarfed and shoots, stunted. Then, dieback occurs, progressing from the tip of branches downward. Root rot is always unsightly and often fatal.



Wilted and dead leaves often signal root rot.

The best offense is good, defensive care. "Maintain the health and vigor of the plant," says Michelle Bachtold, of the University of Illinois Extension. Give rhododendrons the conditions they require: acid soil, some protection from wind and sun, and—above all—moist, well-drained soil. Soil should be loose and allow for air penetration.

Some *Rhododendron* cultivars and species are highly resistant to root rot, including 'Caroline,' *R. davidsonianum* 'Serenade,' *R. occidentale*, *R. pseudo-chrysanthum*, and *R. poukhanense*. Others that show good resistance include 'Brickdust', 'Disca', 'English Roseum', 'Rocket', *R. aberconwayii*, *R. ponticum*, and *R. rigidum*.

The following mail-order nurseries carry these plants: **Girard Nurseries**, (440) 466-2881, [www.girardnurseries.com](http://www.girardnurseries.com);

**Greer Gardens**, (800) 548-0111, [www.greergardens.com](http://www.greergardens.com); **Rare Find Nursery**, (732) 833-0613, [www.rarefindnursery.com](http://www.rarefindnursery.com).

The American Rhododendron Society's Web site ([www.rhododendron.org](http://www.rhododendron.org)) maintains a list of the best rhododendron species and cultivars for different regions of the country.

## ORGANIC PRODUCE HIGHER IN ANTIOXIDANTS

Organic gardeners and farmers maintain that growing plants without chemical fertilizers and pesticides is better for the environment. Now, recent research by Alyson E. Mitchell of the University of California at Davis suggests that organically-grown produce contains more cancer-fighting antioxidants than conventionally grown fruits and vegetables.

Mitchell found the percentage of antioxidants in organically grown corn, strawberries, and marionberries to be between 19 and nearly 60 percent greater than in conventionally grown food.

Mitchell reasons that when insects nibble on unprotected plants, those plants produce "bitter or harsh phenolics" as a means of defense. These natural compounds also happen to enhance human health. When plants are treated with chemical pesticides, she says, production of phenolics may be inhibited.

## BACKYARD WILDLIFE HABITAT PROGRAM TURNS 30

In 1973, in response to concern that conventional landscaping practices—dominated by lawns and plants dependent on chemicals and supplemental watering—disturbed the balance of the ecosystem and contributed to a drastic reduction in wildlife habitat, the National Wildlife Federation started the Backyard Wildlife Habitat Program. For 30 years, the program has educated people about the benefits of creating and restoring natural landscapes and certified the backyards of those who put theory into practice. By April, 2003, 35,600 backyards had been certified.

To become involved in the program, order the Backyard Wildlife Habitat Kit, available for \$14.95 from the National Wildlife Federation, 1100 Wildlife Center Drive, Reston, VA 20190-5362, (800) 822-9919, [www.nwf.org](http://www.nwf.org).



*Gentians revitalize the late-summer garden with their cool blue blossoms.*

BY GENE E. BUSH

I WAS WANDERING through a nursery on a sunny summer afternoon several years back, and, needing a break from the heat, I sat down beneath a tree. Directly across from me, nestled between two large stones in a raised bed, I spotted a tight bun of bright green about four inches tall and eight inches in diameter. Floating above the foliage were large trumpets of brilliant blue, a blue so deep in saturation I felt as if I could wade ankle deep through it. It was the first gentian I had ever seen in bloom, and the image remains vivid to this day.

#### MORE THAN JUST BLUE HUES

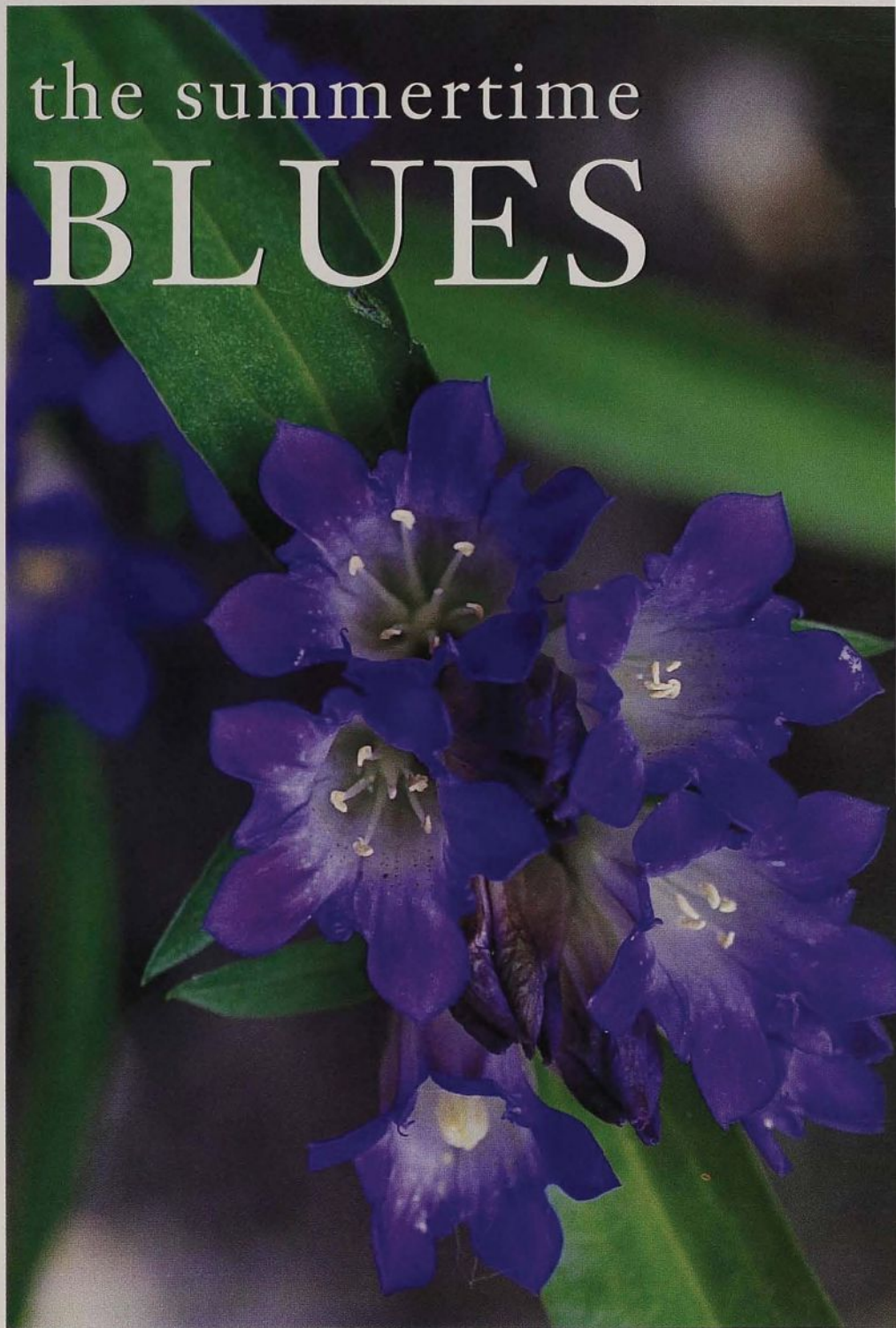
The genus *Gentiana* consists of some 400 species of herbaceous annuals, biennials, and perennials widely distributed in temperate regions throughout the world. Most species hail from alpine habitats while others, including a few North American species, are prairie or woodland wildflowers.

They are the “type,” or namesake genus of the gentian family (Gentianaceae) and their closest ornamental relations include prairie gentian (*Eustoma* spp.), German violets (*Exacum* spp.), rose pinks (*Sabatia* spp.), and centaury (*Centaurium* spp.).

Although best known for their blue flowers, some gentian species have white flower forms, and there are a few yellow-blooming species, as well as pink and near-red. But the majority range from a rich royal blue to a milky blue, in hues that can be as clear as an afternoon sky in midwinter, or as soft and muted as a foggy morning in summer. Spots and stripes may appear as overlays on the inside of the trumpet-shaped bloom. Quite frequently, the flowers change color as they age—a shift that can result in two or three shades of bloom on the same plant.

**Intensely blue flowers are characteristic of gentians like *G. dahurica*, native to China.**

# the summertime BLUES



Some gentians bloom in the spring, but most flower in summer and fall, and a very few will even drift into early winter in bloom. It's this cool late-season color that makes gentians so valuable; with careful planning, it's possible to select gentians that will give your garden the blues from July through mid-December.

The foliage of gentians is as varied as their blooms. Some have fleshy leaves with a rounded outline. The leaves of other

species can easily be mistaken for tufts of grass at a casual glance. On some species, leaves can be as narrow as pine needles; others can be broad, coarse, heavily veined and ribbed. Their foliage ranges in color from a soft, felted green, to yellow-green or bright waxy green. And though most gentians are deciduous, a few are evergreen or semi-evergreen.

Add to this mix a diversity of growth habit that ranges from a ground-hugging



## GROWING GENTIAN FROM SEED

Over the years I have developed a successful one-size-fits-all method for sowing gentian seeds. My first task is to collect the seeds from plants in my garden or order them from seed houses—taking delivery by no later than December or January. Germination rates are far better with fresher seed.

When sowing, my preference is for several small pots over one large pot or pan. I fill individual pots to just below the rim with a sterile peat-based potting medium, and gently level and pack with the bottom of another pot. Once a smooth surface is ready, I sow a tiny pinch of seeds on the surface. Not all seeds will be viable, and I over-sow to compensate. I can always thin out later on, but I don't want to disturb my seedlings for the first year. I also find that gentians like company and do better if there are two or three plants to a container.

After covering the dustlike seeds with granite chicken grit, I place the pots in a pan of water to soak until the surface of the grit shows moisture. I allow the pots to drain before I move them to a protected area outside, surrounded by railroad ties placed four feet apart, under high shade. Here they will ride with the local weather for stratification. Come late spring, little green noses will begin to poke through the soil.

I fertilize with half strength of a complete liquid fertilizer (10-4-3) once a month until around August and then stop for the year. The following year I will transplant seedlings to larger containers or plant directly into the garden. I like to move good sized plants from container to garden in April to give them a bit of time before the hot and dry weather hits, and before the first blooms appear. I also plant quite a few in fall after bloom, but with time to settle in before winter arrives. —G.E.B.



The aptly named cross-leaf gentian (*G. cruciata*) holds pairs of leathery leaves at right angles with deep blue flowers close to the stem. This species is one of the easiest to grow.

green pancake to a tall stately plant well over four feet in height.

Given their range of native habitats, sizes, and growth habits, it is not surprising that you can find gentians suited to a variety of garden settings, from rock gardens or crevices in a wall, to a moist woodland garden or a sunny mixed border.

In this article I focus on several of my favorite perennial gentians that bloom in summer and fall. All thrive in my garden on the border between USDA Plant Hardiness Zone 5 and 6 and in AHS Plant Heat Zone 7. A few other gentians are listed in the chart on page 27.

### OLD WORLD GENTIAN

The cross-leaf gentian (*G. cruciata*, USDA Plant Hardiness Zone 3–7, AHS Plant Heat Zone 7–1) is one of the most popular garden gentians and for good reason: It is among the easiest to germinate from seed, transplant with success, and grow in the average garden. A native of Europe and Asia, it tolerates a wide range of soils, soil pH, and site exposures. However, it will grow best if you give it good soil and consistent moisture so it doesn't dry out severely. Full sun until mid-afternoon seems to suit best in my garden.

On mature plants, a basal rosette of deep green leathery leaves forms each year

from which several stems emerge. The stem leaves, up to four inches long, are lance-shaped and arranged in twos, with each pair growing perpendicular to the next, giving the plant its common name. These clump-forming plants range in height from 10 to 16 inches.

The small purple-blue flowers bloom in terminal and axillary clusters above the foliage. Mine bloom in July and August.

*G. dahurica* (Zones 4–7, 7–1), native to China, is not fussy about soil pH. It can be grown in full sun to the north of where I garden in central Indiana, and with some shade to the south of me. Growing to 16 inches in height, this species prefers deep garden soil to accommodate its distinctive threadlike roots, which remind me of a frayed rope. The plant's long, narrow basal leaves are arranged loosely around the top of the rootstock, giving the plant a relaxed appearance. Flower stalks bear their own sets of smaller, narrower leaves. In July, the clusters of deep clear-blue flowers are so numerous they usually bear the stems to the ground.

*G. gracilipes* (Zones 6–8, 8–6) resembles *G. dahurica*, but its leaves are smaller, about six inches long, and are arranged in a rosette. Flowering stems are branched, with each branchlet carrying a single, narrow, bell-shaped bloom of pur-



With its narrow leaves and white-throated flowers, *G. paradoxa* looks dainty but is very hardy and adapts to many types of soil.

ple-blue. A native of China, *G. gracilipes* has the same preferences for soil and exposure as *G. dahurica*.

Long popular in Europe and beginning to make headway into American gardens is *G. paradoxa* (Zones 5–7, 7–5). Native to the Caucasus Mountains, it is quite hardy and has a tolerance for a wide range of soils. This is a refined-looking perennial that is tough as nails. The straight, erect stems with very narrow leaves reach less than a foot for me.

The striking, two-inch-long flowers of *G. paradoxa* are mid-blue with a much lighter throat. The secondary folds around the lip of the trumpet-shaped blooms have pleats that create a very delicate appearance, so position plants close to a path for optimal viewing. I have mine in a rock garden setting along a ledge on the western edge of my garden, mulched in pea gravel. Its bloom period extends from August well into early October.

## NATIVE SPECIES

Two of my favorite species are native to the eastern United States, and they bear a superficial resemblance, both having bottle-shaped blooms.

The closed gentian (*G. andrewsii*, Zones 3–7, 8–1) grows best in a somewhat acidic soil. Mine is situated in soil that has had peat and composted leaves dug into it. It prefers consistent moisture, but will do satisfactorily with average amounts if mulched. A site with half-shade or high, open shade is best.

Closed gentian reaches about 18 inches to a bit over two feet in height when well grown. It has a central whitish rootstock that resembles that of a parsnip. Its stems are clad in paired, deep green leaves two inches long. Its purplish-blue flowers, which resemble miniature bottles or Christmas tree lights, appear in late summer and never fully open.

The soapwort gentian (*G. saponaria*, Zones 4–7, 8–1) can grow to three feet in height, I am told, but in my garden it reaches about 18 inches and then arches over. Its common name derives from its elliptical to lance-shaped leaves, which resemble those of soapwort (*Saponaria*



## Resources

**Gentians** by Fritz Kohlein. Timber Press, Portland, Oregon, 1991.

**A Gardener's Encyclopedia of Wild Flowers** by C. Colston Burrell. Rodale Books, Emmaus, Pennsylvania, 1999.

**Growing & Propagating Wildflowers of the US & Canada** by William Cullina. Houghton Mifflin, Boston, Massachusetts, 2000.

## Sources for Plants

**Mt. Tahoma Nursery**, Graham, WA. (253) 847-9827.  
[www.backyardgardener.com/mttahomal](http://www.backyardgardener.com/mttahomal) Catalog \$2.

**Munchkin Nursery & Gardens LLC**, Depauw, (812) 633-4858.  
[www.munchkinnursery.com](http://www.munchkinnursery.com). Catalog \$3.

**Roslyn Nursery Inc.**, Dix Hills, NY. (631) 643-9347. [www.roslynnursery.com](http://www.roslynnursery.com).  
Catalog \$3

**Siskiyou Rare Plant Nursery**, Medford, OR. (541) 772-6846.  
[www.siskiyourareplantnursery.com](http://www.siskiyourareplantnursery.com). Catalog \$3

## Sources for Seeds

**Alplains**, Kiowa, CO. (303) 621-2590. Catalog \$2.

**Northwest Native Seed**, Prunedale, CA. (831) 663-6031. Catalog \$3.





Above: The native closed gentian (*G. andrewsii*) thrives in deep shade and arid soil. Its flowers, which never fully open, appear in fall. Right: The soapwort gentian (*G. saponaria*) produces flowers similar in appearance to closed gentian. These age from blue to red-violet.



*officinalis*). As with bottle gentian, its blue flowers never fully open, but as they age, they develop various shades of red-violet along the veins. The color change may signal to bees that the flower has been pollinated. Mine bloom from late August well into mid-December, when it is not unusual to see flowers poking their noses through snow. They grow best in a lime-free soil at the edge of a woodland or shade garden.

#### SITE SELECTION AND PREPARATION

Perennial gentians perform best with their roots in that good old classical “moist, but well-drained soil,” amended with compost. If preparing a new bed, or renovating an old one to receive your gentians, add about three inches of compost and work it in to a depth of at least eight inches. I also incorporate composted manure, hardwood mulch fines, and shredded leaves.

Gentians are not very heat tolerant for the most part, so plant them where they will get as much light as possible without letting them bake in the afternoon sun. An eastern exposure that gets shade after about three o’clock is ideal in most areas. A full sun exposure will bleach blooms and foliage. European and Asian species, in particular, may be

difficult to grow well in parts of the South where summers are very warm and night temperatures provide little relief. Most of my gentians are on the western edge of my garden, but are shaded from the setting sun by shrubs and taller perennials.

Many gentians are sensitive to soil acidity or alkalinity (pH). In my opinion, part of the genus’s reputation for being

difficult to grow stems from gardeners being unaware of individual species’ soil preferences.

If your garden soil is highly acidic and your gentian of choice prefers a “sweet” soil, or vice-versa, the plant may not be able to draw the nutrients needed from the soil and an otherwise healthy plant may begin to languish. If left uncorrected, the plant will starve to death over time.



The loose-limbed willow gentian provides late-summer color in a woodland garden.



## MORE GENTIANAS FOR VARIOUS SITES

### ROCK GARDEN

Name	height (inches)	bloom color/time	origin	habit	USDA Hardiness/AHS Heat Zones
<i>Gentiana decumbens</i>	6–10	deep blue to purple-blue/ late summer	Asia	upright	4–8, 8–1
<i>G. sino-ornata</i>	2–4	bright blue, striped/fall	Asia	prostrate	5–7, 7–5
<i>G. sino-ornata</i> 'Alba'	2–4	white/fall	Asia	prostrate	5–7, 7–5

### BORDER

<i>G. clausa</i> (bottle gentian)	12–24	dark blue and white/fall	North America	upright	4–8, 8–1
<i>G. makinoi</i>	18–20	pale blue/late summer	Japan	upright	3–7, 7–1
<i>G. makinoi</i> 'Royal Blue'	18–20	bold blue/late summer	Japan	upright	3–7, 7–1

### WOODLAND

<i>G. asclepiadea</i> (willow gentian)	20–30	blue-purple, spotted/ late summer	southern Europe	arching	6–9, 9–6
<i>G. septemfida</i> (crested gentian)	6–12	light blue, variable/ mid-late summer	Asia	low spreading	6–8, 8–6
<i>G. septemfida</i> var. <i>lagodechiana</i>	6–8	dark blue/mid-late summer	Asia	prostrate	6–8, 8–6

There is generally more success in knowledge than luck, so before planting a gentian, have your garden soil tested.

### CULTIVATION AND MAINTENANCE

One of the best things about growing gentians is that, once they are established, you can generally leave them alone. Mulching and trimming the dead foliage away in spring before the new growth emerges for a cleaner appearance are pretty much all they need.

Mulch moderates temperature fluctuations and helps to prevent moisture evaporation, maintaining a more consistent level available to the plant. I use chopped leaves around my larger plants, but keep it away from the crown, where it might encourage rot. I like to site my smaller gentians among rocks, relatively close to a path. When transplanting, I mulch them with pea gravel, tying the larger stones together in a scene such as one might see along a mountain trail.

### COMPANIONS

In selecting companion plants to complement my gentians, I find mimicking



The blue flowers of willow gentian are a perfect match for *Hydrangea* 'Westfallen'.

nature works well. Their period of bloom is so long that I don't attempt to match them up with other perennials that bloom at the same time or even for part of it.

Short to medium-height grasses that offer summer and fall color are excellent companions for gentians, along with

*Carex* spp. or other sedges. Small shrubs—especially ones with good summer and fall foliage color—make a wonderful backdrop. For those who insist upon more color, the smaller aster species and hybrids are hard to beat.

### TRUE BLUE

The color blue is uncommon in perennials, and a good clean, true blue is even rarer. For that reason alone it's worth growing gentians. Try a few and you may find yourself bundling up in late November and early December to view *G. andrewsii* or *G. saponaria* in full bloom. Green foliage untouched by frosty temperatures, deep blue blooms with a background of

brown, red, and gold of fallen leaves create a breathtaking sight that will ensure a place for gentians in both your heart and your garden.

*Gene E. Bush is a gardener, writer, photographer, and lecturer on shade gardening. He grows and sells rare or uncommon shade-loving herbaceous perennials through Munchkin Nursery & Gardens in Depauw, Indiana.*





CAROL AND HUGH NOURSE



Creating a miniature bog garden in a container is an easy and entertaining project.

# The Potted Bog

ARTICLE AND PHOTOGRAPHS BY CAROLE OTTESEN

**I**F YOU THINK of bogs as slimy, snakey, and squishy underfoot and the words “bog garden” strike you as an oxymoron, read on! You may become one of a growing number of gardeners who will discard images of pre-historic human sacrifice and man-eating Little-Shop-of-Horrors plants to discover the pleasures of bog gardening. If so, you’ll learn that bogs are unique ecosystems that are easily maintained, happily containerized, and, best of all, home to a range of fascinatingly beautiful, carnivorous plants.

Loosely interpreted, the word “bog” refers to any ground that is water-logged. But the kind of bog that supports carnivorous plants is both water-logged and nutrient poor. Usually highly acidic, it is composed of accumulated organic material—most often, sphagnum peat.

The kinds of plants that live in this nutrient-poor habitat descended from primitive pre-historic ancestors and have had eons to develop cunning mechanisms for deriving nourishment by means other than from the soil. In other words, they trap their own food.

“Most folks assume that such weird vegetation certainly must come from some far-off, exotic and tropical country, necessitating a hot and steamy greenhouse in which to grow them,” writes nurseryman Peter D’Amato of California Carnivores in *The Savage Garden*, which won an AHS Book Award in 1999. “In truth...most carnivorous plants grow in temperate climates...and the North American continent has the widest variety of ornamental carnivorous plant genera in the world.”

Being able to watch these ornamental natives dine has great entertainment value as well as a practical aspect: Plants that feed themselves don’t need fertilizer. In fact, fertilizer, good soil, and

mineral-enriched water are all too rich a diet for most carnivorous plants. What they need is pure water, a sterile, acidic growing medium, and a place in the sun. These simple needs render them ideally suited for life in a container where they can be combined with other plants or grown alone. Either way, their culture is so easy, a child could tend them.

Young children, being the primitive beings they are, love to tend them. Their ghoulish curiosity has not been dulled by years of concentrated civilization. They will watch with fascination as pitcher plants lure unsuspecting insects to be imprisoned and

digested. Forget grandma’s gallstones, the fingernail that fell off when the car door slammed on it, or the desiccated anole you finally found under the dishwasher. Containerized bog gardens with their ravishing, ravenous plants are the ultimate show-and-tell.

## PLANTS FOR THE BOG GARDEN

Finding plants well suited to a bog garden environment is actually quite easy, especially since many carnivorous plants are native to North America. Just be sure you purchase your plants from a reputable source (see “Sources,” page 30). Many bog plants

are illegally harvested from the wild and certain species are endangered. Buying propagated plants is not only easy on the environment and likelier to yield healthy plants, it will enrich your bog with extraordinarily ornamental hybrids and selections.

Over the last decade or so, a number of outstanding pitcher plants with gorgeous leaves and spectacular flowers have been selected and propagated by tissue culture. One of these, released by the Atlanta Botanical Garden (ABG), is *Sarracenia leucophylla* ‘Tarnok,’ a white-topped pitcher with maroon-red veins. It bears cranberry red flowers that stay showy from spring until fall.



The pitcher plant (*Sarracenia* spp.) is highly adaptable. Opposite: Hybrid pitcher plants in bloom at the Atlanta Botanical Garden. Above: Red pitcher plants in a terracotta dish make an unusual centerpiece for an outdoor patio table.



**Pitcher plants** (*Sarracenia* spp.) are eating machines. Every aspect of their anatomy is adapted to lure, trap, and digest food.

Nectar glands and bright red veins attract prey to the plant's lip—a structure that doubles as a handy landing pad. From here, the insects—often flesh flies (*Sarcophagidae*) and ant species—are lured down inside the pitcher—almost always a one-way trip. Downward-pointing hairs accelerate progress down, but impede any escape upward. Farther along the tubular leaf is the slippery slope. On its sticky edge, the unfortunate insects struggle, then plummet to their deaths in the drowning pool at the base of the pitcher.

**Venus flytrap** (*Dionaea muscipula*) is well-named. Its eyelid-shaped leaves form two halves of an efficient trap. When lured by nectar, an insect lands on one of the leaves—the eye shuts. Large hairs, like eyelashes, act as bars to keep it imprisoned while enzymes in the leaf glands digest it. While Venus flytrap is endangered in the wild, plants have been produced by tissue culture. A beautiful red cultivar, 'Red Dragon' (sometimes listed as 'Akai Ryu') was introduced by ABG in 1997.

**Sundews** (*Drosera* spp.) have long tentaclelike leaves that are covered with a sticky substance that glitters like dew in the sunlight. It also acts like a powerful glue. When an insect lands on the leaves it is stuck fast. As the insect struggles to escape, hairs on the tentacles close around it and digestive enzymes begin their work.

**Cobra orchid** (*Darlingtonia californica*) resembles a cobra head with a hood and "fangs"—a fishtail-shaped appendage below the hood. Native to California and coastal Oregon, cobra orchids are denizens of running water in areas underlain by serpentine rock—habitat requirements that are difficult to duplicate in a container garden. Insect prey are attracted by a sweet nectar fragrance and may fly or crawl to the rolled edge of the plant's mouth from where they topple into the depth of the pitcher's hollow leaf. Downward-pointing hairs impede escape.

## RARE AND ENDANGERED PLANTS

Carnivorous species turn up with discouraging regularity on lists of the rare and endangered. Thirty-one species and subspecies of *Sarracenia* appear on many state lists of rare, protected, or at-risk plants. And three pitcher plant species as well as the Venus flytrap have been listed as "federally endangered."



**Top: A Venus flytrap. Above: A sundew. Right: Pitcher plants growing wild in a Mississippi bog. Many natural habitats are endangered.**

## Sources

**Meadowview Biological Research Station** in Woodford, Virginia, is a non-profit organization dedicated to preserving and restoring pitcher plant bogs in Maryland and Virginia. A beginner's package of one pitcher plant, a Venus flytrap, and a sundew is available for \$15 from its Web site ([www.pitcherplant.org](http://www.pitcherplant.org)). (840) 633-4336.

**California Carnivores**, Sebastopol, CA. (707) 824-0433. [www.californiacarnivores.com](http://www.californiacarnivores.com). (No catalog)

**Plant Delights Nursery, Inc.**, Raleigh, NC. (919) 772-4794. [www.plantdelights.com](http://www.plantdelights.com). Catalog for 10 first-class stamps.

## Resources

**Carnivorous Plants of the United States and Canada** by Donald E. Schnell, Timber Press, Portland, Oregon, 2002.

**The Savage Garden** by Peter D'Amato, Ten Speed Press, Berkeley, California, 1998.



Ironically, while digging up a single Venus flytrap in North Carolina could land you in jail with fines up to \$50,000, razing an entire bog to make way for a housing development doesn't seem to raise an eyebrow. "In the United States, over 95 percent of the original carnivorous plant habitats along the southeastern coastal plain are gone," says D'Amato, adding, "the devastation and disappearance of carnivorous plant habitats throughout the world is currently beyond alarming."

*Carole Ottesen is an associate editor of The American Gardener.*



## CREATE YOUR OWN BOG GARDEN PLANTER

Containers make it easy to satisfy the needs of carnivorous plants, which are: an acidic, low-nutrient growing medium, mineral-free water, consistent moisture, and full sun. The growing medium is a blend of fine sphagnum peat and children's playground sand that has been washed. To supply the plants with mineral-free water, you can collect rainwater or use bottled drinking water labeled sodium-free; boiling tap water will not remove minerals.

One of the attractions of growing carnivorous plants is their low maintenance. For several years, I've grown them in containers left outside year round in an exposed area of my USDA Zone 7, AHS Zone 7 garden. I've lost some sundews and Venus flytraps to smothering by sphagnum moss but not to winter cold. —C.O.

### WHAT YOU WILL NEED

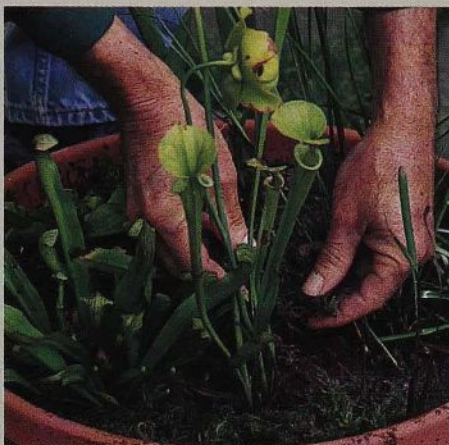
- Assorted carnivorous plants
- Container with a drainage hole and a deep dish or tray that holds water on which the container can be set to keep the growing medium wet
- Sphagnum peat
- Sand (well washed)
- Perlite or pine needles (optional)
- Bucket for mixing growing medium
- Water (mineral free)
- Sheets of live sphagnum moss



**1. PREPARING THE CONTAINER.** Combine equal amounts of sphagnum peat and sand in a bucket with water until you get a mudlike mixture. You can also mix in perlite or pine needles if you want some texture. Then fill the container with the mixture—firming it down to remove air pockets—to within two inches of its rim. Set the container in a water-filled tray.



**2. PLANTING THE CONTAINER.** Set the potted plants on the surface of the filled container until you get a design you like. A tip: Set taller plants either in the middle or off to one side. Then make a hole in the growing medium below each pot and insert the plants, tamping around the rootballs.



**3. FINISHING.** Carefully arrange wet pieces of live sheet sphagnum moss on top of the growing medium around each plant. This makes the container more attractive and also helps prevent the medium from drying.



**4. REGULAR MAINTENANCE.** A container bog doesn't need a lot of care beyond watering. The occasional weed and overgrown sphagnum moss can be removed as needed. Plants go dormant in the winter. In spring, just cut away the dead parts with pruning shears before growth resumes.



*reblooming*

*The identification of bigleaf hydrangea cultivars that rebloom reliably will mean gardeners no longer have to suffer through hydrangea envy.*

BY RICHARD E. BIR

# HYDRANGEAS



Endless Summer™

COURTESY OF BAILEY NURSERIES





'All Summer Beauty'

**N**O DOUBT YOU have visited or seen pictures of gardens where stunning flowers of bigleaf hydrangeas (*Hydrangea macrophylla*) are on display. They may be blue, purple, soft shell pink, hot pink, reddish, ivory, or white. No matter the color, in full bloom, bigleaf hydrangeas are the superstars of the summer garden, capable of stopping gardeners and passersby dead in their tracks.

But while they can be truly spectacular

during their period of summer bloom, for those of us who've grown one that failed to bloom or bloomed for just a short period, they can be equally as frustrating. Hydrangea bloom failure has many potential causes (see page 36), but most commonly it happens because flower buds were killed by late spring frosts or were lost when stems were pruned at the wrong time.

For the hydrangea-challenged, help is on the way in the form of selections that

### *Dependable Rebloomers*

(pink to blue flowered unless otherwise noted)

#### **Mopheads**

- 'David Ramsey'
- Endless Summer™
- 'Madame Emile Mouillère'
- (white)
- 'Oak Hill'
- 'Penny Mac'

#### **Lacecaps**

- 'Lilacina'

### *Opportunistic Rebloomers*

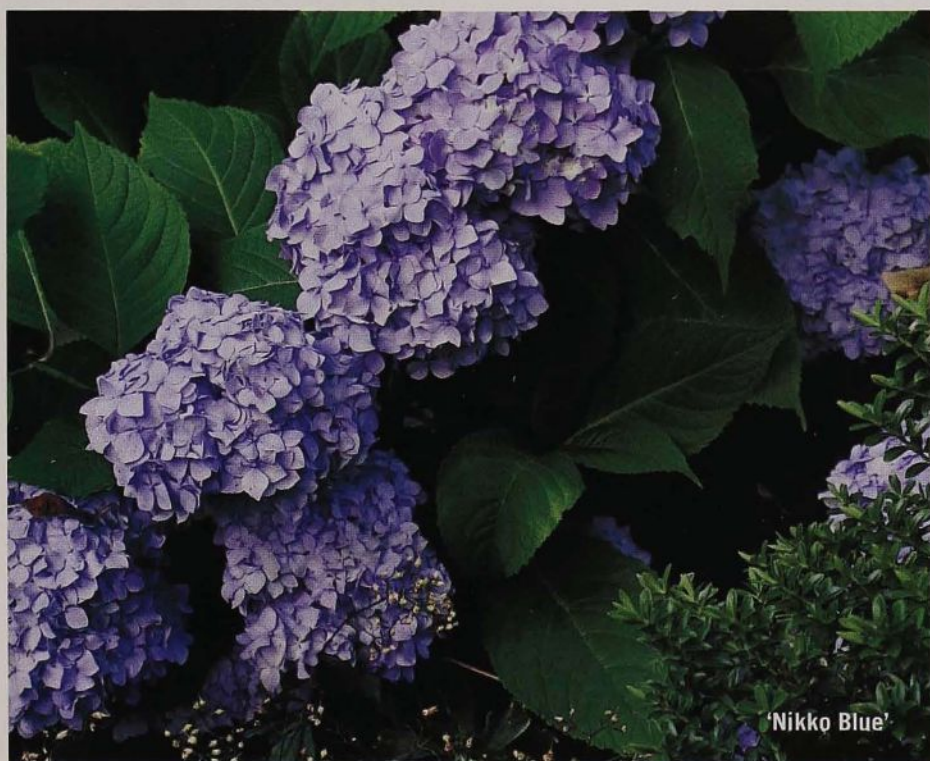
(pink to blue flowered unless otherwise noted)

#### **Mopheads**

- 'All Summer Beauty'
- 'Altona' (lilac to purple)
- 'Blue Danube'
- 'Europa'
- 'Kluis Superba'
- 'La Marne'
- 'Nikko Blue'
- 'Souvenir of the Visit of President Doumier'

#### **Lacecaps**

- 'Coerulea Lace'
- 'Lanarth White' (white)
- 'White Wave' (white)



'Nikko Blue'

rebloom reliably even in the face of ill-timed pruning or the vagaries of early spring weather. Unlike standard bigleaf hydrangeas, these plants are truly remontant, or reblooming, producing new flower buds all season long rather than just in late summer.

### **TRIAL AND ERROR**

The discovery of these reblooming hydrangeas can be traced to research that began a decade or so ago. At that time, hydrangeas had gone from being grandma's old porch plants to cutting-edge novelties in that infinite cycle of plant popularity that garden historians remind us about whenever we think we have discovered something new.

In response to the surge in popularity, some horticultural researchers decided to sort out which hydrangeas were best. Trials of hundreds of cultivars were estab-



## Hydrangeas—a Quick Guide to the Genus

Hydrangeas are members of the hydrangea family (Hydrangeaceae), which includes 17 genera of shrubs, woody vines, and small trees found mainly in temperate regions of the Northern Hemisphere. Other major ornamental members of the family are mock oranges (*Philadelphus* spp.) and *Deutzia* spp.

Depending on which taxonomist is counting, between 25 and 80 hydrangea species are recognized, but only five are commonly seen in American landscapes.

The popularity of hydrangeas can be traced to their showy inflorescences (corymbs), which are globular, conical, or flattish clusters of many individual flowers. Some hydrangea inflorescences feature a blend of showy sterile flowers with contrastingly demure fertile flowers—this can create an intriguing “pinwheel” effect.



### **Bigleaf hydrangeas** (*H. macrophylla*, Zones 6–9, 9–3)

Native to Eastern Asia, these divas of the summer garden are usually divided between mopheads (also known as hortensias) and lacecaps.

Mopheads are distinguished by solid-looking mounded to globular inflorescences that are often so heavy they bow down the stems. Lacecaps, on the other hand, have flat to slightly mounded inflorescences that usually feature a central core of fertile flowers surrounded by a ring of showier sterile flowers. The flowers of both types come in a wide array of colors from green to white, pink, purple, and blue.

Bigleaf hydrangeas form mounded deciduous shrubs three to six feet tall. The large leaves from which their name derives are an attractive bright green that provides the perfect backdrop for the spectacular flowers. Hundreds of cultivars have been introduced.

### **Climbing hydrangea** (*H. petiolaris*, Zones 4–9, 9–1)

A shade-tolerant deciduous climber, native to Eastern Asia, that grows 60 to 80 feet given sturdy support. Four-season interest comes from glossy dark green leaves, white flowers in flat-topped panicles in midsummer, and rusty brown exfoliating bark.

### **Oakleaf hydrangea** (*H. quercifolia*, Zones 5–9, 9–1)

An underused shrub, native to the American Southeast, oakleaf hydrangea grows four to eight feet tall and spreads as much or more through suckering roots. It offers four-season interest through

ruggedly handsome deep green leaves that turn red to purple in autumn, tapered panicles of midsummer white flowers that persist into fall, and exfoliating rusty-brown stems revealed in winter. ‘Snowflake’ is an outstanding selection.

### **Paniced hydrangea** (*H. paniculata*, Zones 3–8, 8–1)

Native to China and Japan, this treelike hydrangea was once a landscape staple but fell out of favor for a time because it is rather coarse-looking except when in bloom. But with the emergence of new cultivars in recent years, it is beginning to make a comeback. It flowers on new wood or current season’s growth and can be severely pruned after fall frost yet still flower the following summer. It grows 10 to 20 feet tall and equally broad. White flowers bloom in pyramidal panicles in late summer to fall, turning pinkish purple with age.

### **Smooth hydrangea** (*H. arborescens*, Zones 4–9, 9–1)

A coarse-looking shrub native to the eastern United States, smooth hydrangea grows three to five feet tall and wide and bears slightly mounded panicles of white flowers from midsummer into fall. Because it flowers on new wood, it can be cut to the ground each winter to yield abundant flower heads on three to four foot straight stems—perfect for big summer vases. Where seasons are long, gardeners are often rewarded with a burst of shorter stemmed flowers in early fall. ‘Annabelle’ and ‘Samantha’ have the showiest flowers among the cultivars.



lished at several sites around the United States, including where I work at North Carolina State University's Fletcher research station, and at the University of Georgia, where Jeff Adkins oversaw trials under the direction of woody plant guru Michael Dirr. The most exciting—if somewhat unexpected—outcome of this research was the discovery that some cultivars are truly remontant.

During trials in Fletcher, where we enjoy the mild climate of the North Carolina mountains, we discovered to our surprise that some hydrangea cultivars were killed to the ground over the winter yet still produced flowers the same summer. Our first instinct was to try to rationalize this finding based on prevailing wisdom, and indeed we recognized that some of these plants were probably insulated by mulch. However, for some cultivars, this explanation did not work, and we were forced to take a closer look and keep better records.

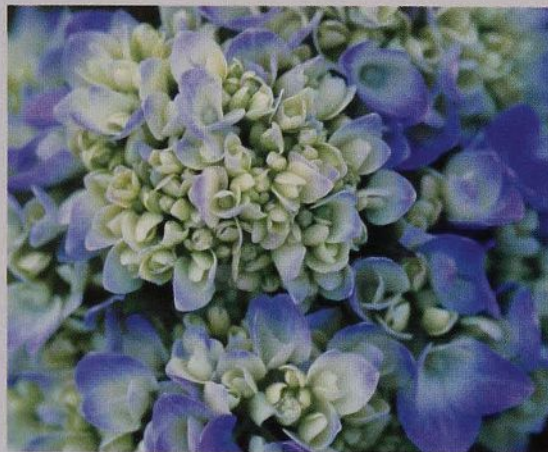
Subsequently, we identified a number of cultivars that produced new flower buds all season long (see box, "Dependable Re-bloomers," page 33). Unlike other bigleaf hydrangeas, the flower buds on these cultivars did not require exposure to winter chilling in order to flower. This suggested that these cultivars were truly remontant. Perhaps the most promising of these selections is *Endless Summer*<sup>™</sup> (its cultivar name is 'Bailmer'), a selection initially spotted by Michael Dirr in 1998 growing in trial plots at Bailey Nursery, a wholesale company in St. Paul, Minnesota. Hardy to USDA Zone 5, *Endless Summer*<sup>™</sup> has pink to blue flowers, depending on soil pH. This promising new plant has been introduced by Bailey and is scheduled to become widely available in spring 2004.

### OPPORTUNISTIC BLOOMERS

In the course of our study, we observed another group of cultivars that flowered at the normal time of June in the mountains of North Carolina and were also in bloom with new flowers forming and opening in September. We suspect that these cultivars (see "Opportunistic Re-bloomers," page 33) are not so much remontant in the traditional sense of the word as they are opportunistic. Flower buds form and, if the weather allows, develop and open in the long, gentle au-

## Hydrangea Acid Test

One of the quirky things about bigleaf hydrangeas is that some selections are able to bloom in a range of hues between pink and blue. Research has shown that the concentration of free (unbonded) aluminum ions in the soil is the key to this floral anomaly. The availability of aluminum ions is related to the degree of acidity or alkalinity of the soil, with more acid soils (pH 5.5 to 6) inducing bluer flowers and less acid to neutral soils (pH 6 to 7) promoting pinker flowers. Soil can be acidified slightly by amending it with elemental sulfur or aluminum sulfate, or it can be "sweetened" by the addition of lime.



The flowers of *Endless Summer*<sup>™</sup> are blue, above, when planted in soil that is on the acid side, but pink in neutral to less acid soil, as shown on page 32.



'Madame Emile Mouillère'



## Resources

**American Hydrangea Society**, P.O. Box 11645, Atlanta, GA 30355.

**Hydrangeas: A Gardener's Guide** by Toni Lawson-Hall and Brian Rothera, Timber Press, Portland, Oregon, 1995.

**Manual of Woody Landscape Plants (5th ed.)** by Michael A. Dirr, Stipes Publishing Co., Champaign, Illinois, 1998.

## Sources

**Forestfarm**, Williams, OR. (541) 846-7269. [www.forestfarm.com](http://www.forestfarm.com). Catalog \$5. Free if ordered online.

**Heronswood Nursery Ltd.**, Kingston, WA. (360) 297-4172. [www.heronswood.com](http://www.heronswood.com). Catalog \$5.

**Hydrangeas Plus**, Aurora, OR. (503) 651-2887. [www.hydrangeasplus.com](http://www.hydrangeasplus.com). Catalog \$4.75.

**Roslyn Nursery**, Dix Hills, NY. (631) 643-9347. [www.roslyn-nursery.com](http://www.roslyn-nursery.com). Catalog \$3.

**Wilkerson Mill Gardens**, Palmetto, GA. (770) 463-2400. [www.wilkersonmill.com](http://www.wilkersonmill.com). Catalog free.

**Woodlanders, Inc.**, Aiken, SC. (803) 648-7522. [www.woodlanders.net](http://www.woodlanders.net). Catalog \$4.

tumns characteristic of the southern Blue Ridge Mountains.

Our hypothesis was strengthened by the results of trials Sandra Reed of the U.S. National Arboretum conducted in Tennessee and Missouri (where winters are colder than those we experience in Fletcher). Cultivars that rebloomed for us did not consistently rebloom in Reed's trials.

### REASONS FOR BLOOM FAILURE

Why is it that some hydrangeas stubbornly refuse to flower or do so for only



a short period in midsummer?

Sometimes the lack of flowers is due to one or more of the usual causes that affect performance of most shrubs, which can be summed up as "excesses." Excess sun or shade, too much nitrogen fertilizer, too wet, too dry, too cold at the wrong time or not enough cold at others. More often, however, the cause is improper pruning by the gardener or a cruel trick by Mother Nature.

The root of the problem is that bigleaf hydrangeas all set flower buds on old wood—this occurs during late summer and fall the year before we see the flowers. Therefore, pruning any time after flower buds form, yet before plants flower means you will be cutting off future flowers. Likewise, anything that damages flower buds will result in a lack of flowers.

Because many of the cultivars of bigleaf hydrangeas were developed for the florist market or for areas with a gentler climate than is found in many North American gardens, some cultivars simply are not very hardy.

Others listed as hardy to USDA Zone 5

or 6 are perfectly flower-bud hardy when dormant. However, when temperatures first rise in late winter or early spring they resume growth—even if it is only a greening and swelling of the buds. At this stage dormancy has been broken and a hard frost can kill the emerging buds. Although most bigleaf hydrangea cultivars will resprout from the base if their stems and buds are killed, they won't form flower buds on this new wood until late summer or fall and thus won't bloom that season.

Gardeners unwilling to accept defeat have been known to go to Herculean efforts to mound mulch around, or build protective structures over, hydrangea stems in fall, then uncover them in

spring to ensure summer flowers.

### A NEW BREED

Now that reblooming bigleaf hydrangeas have been identified, such exertions will, mercifully, become a thing of the past. If you live in an area that experiences variable late winter and early spring temperatures, choosing from these reflowering cultivars may be the secret to having spectacular hydrangea flowers every year.

This quality of continuous bloom—linked with other desirable characteristics, such as foliage and flower variegation, colors, size, and attractive form—will feature prominently in future hydrangea breeding efforts. Although development of additional new cultivars may take decades, dependable bloom is always worth waiting for. 🌸

*Dick Bir, an Extension horticulture specialist with the North Carolina State University's research center in Fletcher, is the author of Growing & Propagating Showy Native Woody Plants.*



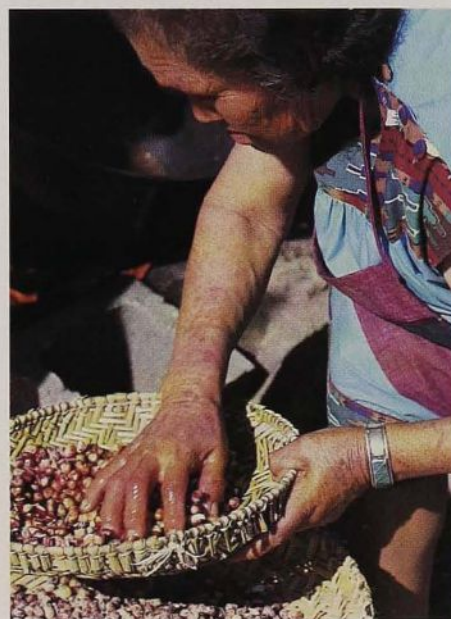
# Saving Seeds *of the* Past

*Native Seeds/SEARCH preserves heirloom seeds of the Southwest with an eye to the future.*

BY MARY F. IRISH

**I**T LOOKS like an ordinary field. Wide furrows split the land into low plateaus, tall corn stalks capture the breeze, and squash vines coat the ground with swollen fruits ripening in the hot Arizona sun. But the crops growing here are far from mundane.

Unfamiliar to today's gardeners, these species have been grown by countless generations of Native American farmers throughout the arid lands of the American Southwest and Mexico. They form the living heart of a remarkable seed-



Above: Continuing tribal custom, a Hopi elder parches a traditional variety of Native American corn. Top: Colorful heirloom corn varieties of the American Southwest.



saving organization known as Native Seeds/SEARCH (the acronym stands for Southwestern Endangered Aridland Resource Clearinghouse) based in Tucson, Arizona.

The important work of Native Seeds/SEARCH (NSS) stretches beyond saving the Southwest's diverse traditional crops from extinction. By collecting, propagating, and redistributing these crops, this

non-profit group is helping to preserve indigenous cultural and dietary practices and agricultural traditions. This year the organization is celebrating its 20th anniversary.



To preserve traditional crops, each must be grown out regularly to produce new seed. Here a team of NSS staff and volunteers plant beans in a freshly prepared field.

### MODEST BEGINNINGS

NSS got its start in 1983 collecting locally derived seed varieties as part of a Meals for Millions program with the Tohono Oodham of southern Arizona. The original program was established to encourage increased farming success by the tribe using "old seed varieties." Farmers who were still growing old varieties were located, and seed was obtained from them. Interest in serious collection grew and Native Seeds/SEARCH was born. With the help of small grants, the first catalog and newsletter were released.

"Since the beginning, we have had the same goals," says board member Mahina Drees, who co-founded the organization with her husband, Barney Burns, ecologist and author Gary Nabhan, and botanist and restoration ecologist Karen Reichhardt. Simply stated, the goals are "to conserve as much of the agricultural biodiversity of the region as we can and distribute as much of it back as we can to farmers in the region."

In 1984, NSS took up residence on the grounds of the Tucson Botanical Garden. The organization continued to grow, adding a retail shop, small growing beds, and demonstration gardens, all the while expanding seed collection.

In 1993, NSS purchased a property in Tucson, and moved in one year later, after extensive renovations. Now known as the Seed Bank, the site serves as the organization's main office as well as a vastly improved storage facility for the seeds.

The NSS staff's greatest dreams were realized in 1996, with the purchase of a 60-acre farm near Patagonia, Arizona, where the vital work of growing out seed to maintain the collection is done.

From the days of seed jars stored in the dining room

and catalogs delivered to the post office one load at a time, the organization has grown in 20 years to more than 4,500 members, about 1,400 of whom are Native Americans. In addition to serving its members, NSS now provides seeds to more than 20,000 retail customers annually.



Gary Nabhan, one of the founders of NSS, checks a developing crop of Arikara Dakota Indian winter squash.





Suzanne Nelson, NSS director of conservation, examines a tassel of corn. Pollen is painstakingly gathered from the tassels to fertilize emerging ears of the same variety.

## SAFEGUARDING DIVERSITY

In contrast to the paltry nine or so species that make up the bulk of the world's food crops, in NSS storage rooms, more than 2,000 selections of seed representing 99 species of beans, corns, squashes, melons, and other crops are carefully preserved.

Why is it important to save the old varieties? In two words: genetic diversity. "These crops have been developed over generations to grow well and produce healthy food under, in some cases, rather marginal conditions: alkaline soils, brutal heat, a pantheon of pests, unreliable rains," explains NSS Executive Director Kevin Dahl. The success of these crops suggests their genetic characteristics are worth preserving.

"Genetic diversity helps crops—all organisms—respond to changing environmental conditions," explains Suzanne Nelson, director of conservation. "New challenges are always arising: increased levels of carbon dioxide, reduced rainfall or changing rainfall patterns, increased population, new insects, and more virulent diseases. Genetic diversity is the pool from which potential answers to those challenges arise."

In addition, says Dahl, "some of these varieties are important to the cultural and

spiritual health of the people who entrusted them to our care."

## STORING THE FUTURE

In the small rooms of the storage area, ceiling-high shelves are crammed with jars of seed in a crazy quilt of color and size. Snug sets of flat, beige squash seeds huddle near the riotous blue, red, yellow, gold, and white ears and bags of corn. And everywhere there are beans; purple



At the Seed Bank, more than 2,000 varieties of traditional crops are carefully preserved.

ones, blue ones, black ones, white ones, speckled and spotted ones.

Despite the homey atmosphere and casual ambience, state of the art techniques for testing and storage are rigorously maintained for the collection. Seeds are either dried, or dried and then frozen for long-term storage. Up to five replications of each variety are prepared and stored.

"The minimum size of a seed sample depends mostly on how the crop reproduces," explains Dahl. For "out-crossers"—plants like corn that cross-pollinate—it takes about 300 seeds to make up enough of a collection to be assured that the genetic diversity will be preserved. For self-pollinating plants or "selfers" like beans, Dahl explains there is less to worry about, "because as selfers, each plant within a population is typically very similar genetically to every other plant in the population—or collection."

As well as preserving biological diversity, the distribution of seed back to tribal farmers helps ensure that cultural diversity is preserved (see "Community Connections," page 41). All the excess seed is either distributed to farmers or sold.

## GROWING OUT CROPS

Living collections present a mammoth challenge to their stewards: to keep the collection intact you have to use it. Seeds cannot be carefully preserved forever, they must be allowed to germinate, grow, and produce new seeds. Planting and harvesting the next generation is necessary to increase the quantity of seed available, maintain the genetic diversity of the crop, and assure continued viability.

The staff of Native Seeds/SEARCH began to plan for grow outs even before the farm was purchased. In an ambitious, but carefully crafted program, NSS is undertaking the first comprehensive grow out of the entire collection. "We have successfully germinated seed that is over 18 years old," marvels Nelson, who coordinated the project.

"We use a 10-year cycle for seed regeneration," says Dahl. This involves removing seed from frozen storage, growing it out under controlled conditions, and then replacing the old sample with newly produced seed. While the 10-



#### FOR MORE INFORMATION

Contact Native Seeds/SEARCH, 526 N. 4th Avenue, Tucson, AZ 85705. [www.nativeseeds.org](http://www.nativeseeds.org). Seed catalog available for \$1.

year cycle works well for most species, others may require more frequent regeneration. Dahl says that the 10-year cycle is somewhat of a compromise between growing out samples before they lose viability, and not exposing them to the vagaries of agriculture. "Growing crops can be a risky adventure," he explains. "The hard part to regenerating is to prevent any selection pressures—from weather, insects, humans, etc.—from acting on the crop. Such pressures can result in a different genetic composition from that of the original collection."

The process begins in the winter with decisions about which crops will be grown that year. Next, a design for the field layout that will accommodate the crops is created. Field design hinges on the pollination strategies of the crops and the insects that visit them.



**Stored seeds at the NSS Seed Bank represents future crops of traditional varieties.**

Beans are predominantly self-pollinators and do not attract many pollinating insects, so separating varieties by about 20 feet with a row of an insect-attracting crop like buckwheat is sufficient. But chiles, which are highly attractive to their insect pollinators, must be shielded from accidental pollination. Watermelon is much the same, and for both these crops specialized cages that can be placed over the crops are used to isolate the flowers and guarantee the varieties remain true. Bee boxes are placed within the enclosures and rotated through the fields so



**Among the Native American crops traditionally grown in the Southwest are many kinds of beans, including black, white, and tan tepary beans (*Phaseolus acutifolius* var. *latifolius*).**

that each planting has enough insect activity to assure a large crop of fruit.

Corn is undoubtedly the most difficult crop to grow out. The windborne pollen of corn floats on the wind and is capable of being carried miles away from the parent plant and finding receptive ears in other fields. Each plant must have its pollen gathered from the tassels. Emerging ears must then be isolated long before they even look like an ear with paper bags. Finally, as the ear matures, the appropriate pollen must be deposited to fertilize it and the entire ear must be bagged once again.

In 2002, more than 150 varieties of corn were grown out, each requiring this tedious and time-consuming care. But the results were gratifying—acres of corn varieties, each pollinated only by its own variety, making plump ears of seeds that will find their way into gardens and farms, as well as back into the seed bank. Eventually stored seeds will return to the Patagonia farm to start the entire cycle again.

#### THE GOAL OF SELF-SUFFICIENCY

For the NSS seed savers, the final day of their work will be done when all communities are growing the splendid array found on the shelves of the seed bank in their gardens, saving and renewing these crops from their own fields, and ensuring

that all the crops that are important and useful to them are securely tucked away waiting for the next planting season.

No one knows how many different varieties have been grown in the region over the centuries, or how many have been lost forever to drought, changing land use and farming habits, and plain bad luck. But for the seeds that have been found and the people that depend on them, the seed bank of NSS and its peaceful farm nestled beside Patagonia Creek point to a future rich in the diverse crops long nurtured by the people of the Southwest.

As it celebrates its first two decades, the NSS staff looks to the future with a vision of improved and expanded facilities, both to safeguard the current collection, and to add to it with more varieties obtained from native farmers. "The next two decades will continue the never-ending cycle of regenerating these seeds," says Dahl, "as we grow stronger in our role as permanent stewards of this living treasure."

*Mary F. Irish has written and lectured extensively on desert gardening and has tended her own garden in Arizona for 17 years. Her most recent books are Arizona Gardener's Guide and Month by Month Gardening in the Desert Southwest (both published by Cool Springs Press, 2003).*



# Community Connections

**A**LL OF THE efforts of Native Seed/SEARCH in saving, growing, and maintaining the seed would be incomplete without companion programs to return these varieties to the communities that once grew them. Approximately 75 percent of the holdings in the seed bank came from Native American farmers who live in the greater Southwest. These crops play significant roles in the cultures and traditions of the nearly 50 Native American tribes that live in the region.

## TOHONO OODHAM COMMUNITY ACTION (TOCA) PROJECT

“Food is culture, they cannot be separated for us,” says Tristan Reader, Co-Director of the Tohono Oodham Community Action (TOCA) project. “The songs we sing, the legends, all of it is bound up with food.” If a particular type of corn that is necessary to make a ceremonial posole is no longer grown, then part of the cultural life of the tribe has diminished as well. When vital components of basketry or pottery traditions are no longer grown, then tribal art forms fade.

TOCA uses the seed bank at NSS to store seeds of long neglected varieties of tepary bean, numerous squashes, corns, and an array of melons. These are in turn distributed to individual tribal members. A tribal farm has been established, and the goal is to raise these crops in large enough quantities to offer their bounty to non-farming members. Ideally, the need to dip into the seed bank will diminish as the tribal farm becomes successful and grows enough to provide its own reserve of seed for the following year’s crop.

## OODHAM OIDAK FARM

A similar effort is taking place on the Oodham Oidak Farm on the Gila River Indian Community. The farm raises a wide array of food that is used to feed the population of the Gila River Juvenile Detention and Rehabilitation Center. This farm, like so many others in the region, began with seed from the NSS seed bank. But the Oidak Farm is now self-sufficient, growing delicious yellow-fleshed watermelon, various

beans including the Piman pink bean and two colors of limas, plus corn, squash, sunflowers, tomatoes, chiles and more.

Traditional basketry—an important art form and craft for the tribe—relies on the devil’s-claw plant, whose long black seed pods provide the backbone of the baskets. This fancifully named plant is carefully nurtured on the farm. Oidak Farm not only produces all the food the Center needs, but saves its own seed for future use, and has a modest excess that is made available through a farmer’s market and other tribal programs.

## TARAHUMARA PROJECT

In northern Mexico, NSS has a long standing project with Tarahumara farmers that has developed into much more than a seed exchange. Farm lands that have been devastated by drought and disruptive land uses are being reclaimed through a wide array of soil conservation techniques. Here it is not just the seed but also the technical and financial assistance provided by staff in Arizona and Mexico that is enabling the tribe to renew its farming tradition.



Intricate designs are typical of traditional Oodham basketry.

## FIGHTING DIABETES

For many Native American communities, the need to reintroduce traditional foods in their daily lives goes well beyond a cultural commitment. Diabetes is a plague among many tribes of this region, and research has determined that one of the best defenses against this deadly disease is increased consumption of traditional foods such

as corn, beans, squash, melons, mesquite flours, cactus fruits, and others that once formed the foundation of Native American diet in this region.

NSS is one of several organizations advocating the value of certain traditional foods in preventing or controlling diabetes. “One stumbling block,” says Dahl, “is the availability of many of these foods. We continue to work with Native American projects and other farmers to provide supplies for tribal schools, hospitals, and elder care programs.” To supplement the seeds, NSS also provides cookbooks, educational materials, and dietary guidance to help address this serious health crisis.

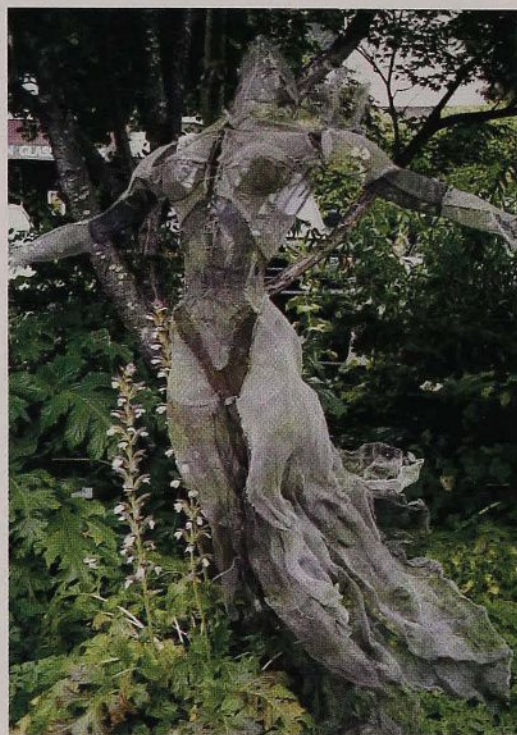
—M.F.I.



# the art of RECYCLING



In Oregon, a group of artists is turning recycled material into beautiful and innovative works of art fit for a garden.



Far left: A garden pedestal crafted entirely from recycled wood by Carrie Stevens. Center: A funky birdbath made of recycled sheet metal and wire by Gary Logue. Above: Sonia Kasparian's diaphanous figure formed of molded wire screen mesh.

**I**F YOU LOVE garden art but yawn at the usual faux stone statues and cement birdbaths, you're not alone. Tess Beistel of Portland, Oregon, has seen her fill of these mass-produced objects. "As a garden designer," says Beistel, "I'm often taken by how *boring* most garden art is." So she co-founded Cracked Pots with artist and self-proclaimed "crazed recycler" Mary Lou Abeln to offer gardeners more imaginative choices and raise environmental awareness in the community.

Cracked Pots—a program within the aegis of a non-profit organization called Cascadia Educational Project, Inc.—shows gardeners endless possibilities for "junk" that would otherwise go to a landfill and provides a way for artists in the Portland region to showcase their work. "It's as much an environmental organization as it is a garden art organization," says Beistel. The project is called Cracked Pots, she explains, because "it reflects a wacky way of doing things. A 'crackpot' is someone who isn't in the mainstream, and that's what we do with garden art. It's about eccentricity."

The idea for Cracked Pots essentially grew out of Abeln's own garden; after Abeln hosted a hugely successful plant and art sale at her home, she and Beistel—whose interest in garden design stems from her appreciation of gardens as their own natural works of art—brainstormed ways to make the sale a full-time gig. That was four years ago, and Cracked Pots continues to bloom.

For the last three years, Cracked Pots has hosted a two-day art fair in August—"one huge, huge extravaganza," according to Beistel. You won't see chubby cherubs or gazing balls here. You *will* see truly unique and unusual items—odd pieces of scrap metal welded into outdoor furniture, lanterns made of steel food cans with intricate punched-out designs, garden statues fashioned from wire mesh, and mosaics crafted from broken glass.

## A HUGE EXTRAVAGANZA

The fourth annual Cracked Pots show is scheduled for August 12 and 13, at a setting every bit as unusual as the artwork—on the grounds of a 38-acre estate called McMenamins Edgefield in Troutdale, Oregon. Once the Multnomah County Poor Farm for local indigents, Edgefield is now a resort combining an inn, winery, restaurant, golf course, and movie theater. For the Cracked Pots fair, artwork is scattered throughout the property, creating an atmosphere Beistel says has "almost a feeling of a medieval village." Last year's show raised nearly \$100,000 and packed the parking lots. Abeln thinks buyers are drawn to recycled art because of the story its reused parts tell. "People are hungry for this," she says.

Participating artist-vendors range from hobbyists, selling fairly simple work for \$10, to professionals, whose creations sell for thousands. Artists are responsible for salvaging their own mate-



rials. Some regularly scour dumpsters; others work out deals with local businesses to collect discarded items. For the event this August, Beistel says about 45 artists from the Pacific Northwest are scheduled to show and sell their work.

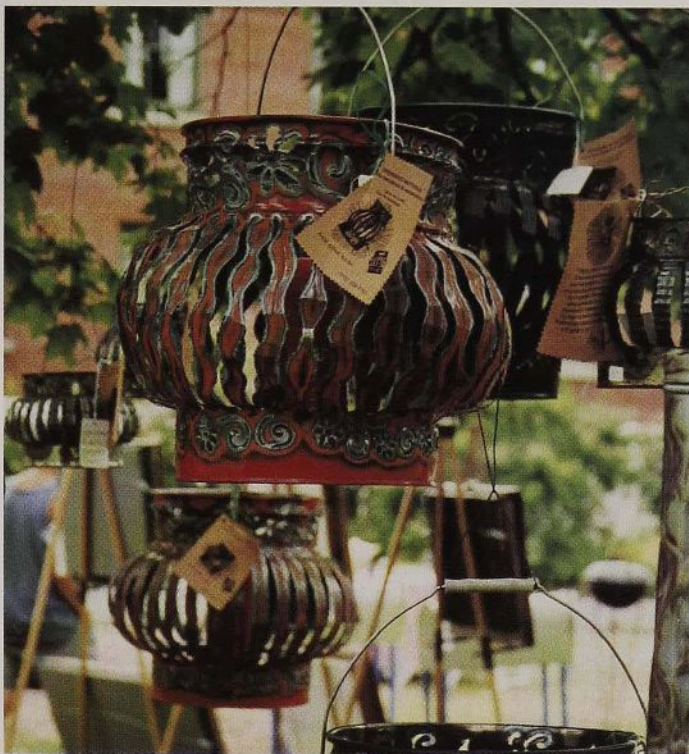
## DRAWING IN ARTISTS

To qualify under Cracked Pots' guidelines, art must contain at least 75 percent recycled material. Pieces are also judged on quality of craftsmanship, function, and ability to withstand the elements. Artists set their own prices and receive 70 to 80 percent commission for the pieces they sell—a figure that is starting to bring artists out of the gallery and into the garden. Cracked Pots is using the proceeds to fund the purchase of recycled art to be installed in public places.

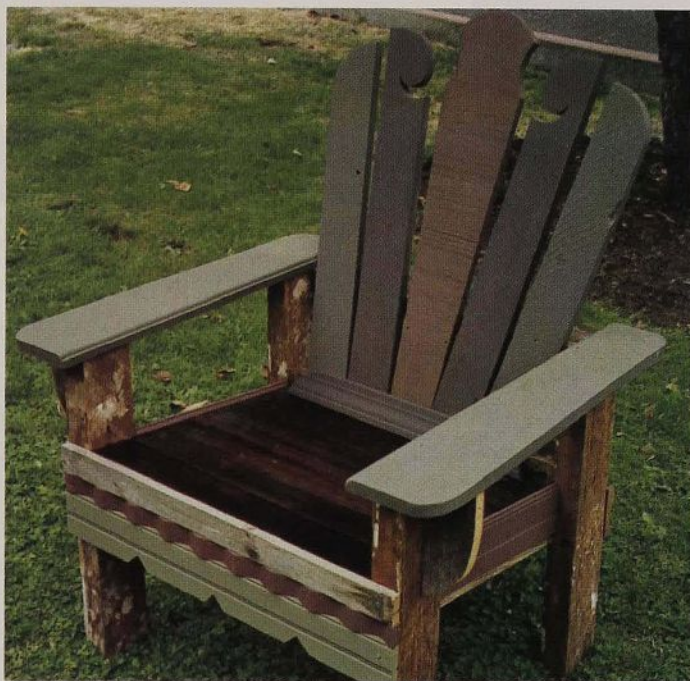
FOR MORE INFORMATION about Cracked Pots, visit the group's Web site at [www.crackedpots.org](http://www.crackedpots.org).

Artist and avid recycler Gary Logue says he never had trouble creating art—it was finding a niche and marketing it that was the problem. Logue heard about a Cracked Pots show, had his work judged, and was accepted as an artist. After two shows, he sold approximately 50 pieces. "I like using things for purposes they weren't intended for originally," Logue says. "This art sparks the imagination on how things can be reused." Logue, now one of four artists on a steering committee for Cracked Pots, says the organization has had a significant impact on both his art and career.

Scott Kelly, another artist on the steering committee, says Cracked Pots has made him "10 times" the artist he was. Kelly was never interested in gardening, but since working with Cracked Pots, he appreciates gardens for the art venue they provide. The contrast of delicate plants against sculpted metal is



Artist Gina Nash turned large coffee cans collected from delis and coffee houses into these intricately sculpted garden lanterns.



Scrap lumber gets a new lease on life in artist Tracy Dow's interpretation of the classic Adirondack garden chair.

something he describes as "God's work with man's work." Kelly now prefers working with recycled material and enjoys the challenge of turning trash into art; the experience has also been educational for him. "It has made me become more aware of how shamefully wasteful we are here in the United States."

## FUTURE PLANS

Cracked Pots might seem to be all about offbeat art, but it's also about giving back to the community—something Abeln calls "a very soul-satisfying endeavor." Beistel and Abeln are currently working to commission art for public places. A local elementary school is slated to be the first recipient of artwork that Cracked Pots will purchase using funds raised from the annual shows.

The organization is also trying to negotiate a deal with the city dump. The dump would donate trash, and Cracked Pots would resell it to consumers at very low prices, all in efforts to keep trash from piling up in landfills, Beistel says.

In the long term, Abeln hopes Cracked Pots can acquire a retail space. Consumers would have more opportunities to buy art, and artists could use the space to run workshops to help members of the community create their own recycled garden art.

Cracked Pots is enjoying success in Portland, an area Beistel says is already "environmentally hip." The organization is little known outside the Pacific Northwest, but its founding mothers, are hoping that will change. "Showcasing this art, which is very unique, is another way of saying that your garden doesn't have to be a cookie-cutter garden," Abeln says. Abeln and Beistel hope their innovative efforts will inspire people everywhere to reuse "junk" and think twice about how they view—and where they find—art.

*Mary Yee is managing editor and designer of The American Gardener and Maureen Hartshorn is the magazine's editorial intern.*





# the evolution of an Organic Garden



*Here's how one woman turned her garden south of Ottawa into a living showcase for organic gardening practices.*

*by Diana Beresford-Kroeger  
photographs by Don Johnston*

**Top:** Birds such as this house wren find abundant food and cover in the Beresford-Kroeger garden. **Above:** One of the organically managed ornamental beds, bursting with an exuberant display of summer flowers.

**F**OR ME, gardening began at the tender age of five when, with a three-penny bit clutched in my hand, I headed into the city center of Cork, Ireland, to purchase a small packet of lettuce seeds. The passion I developed about plants, watching them grow so closely that I could almost hear and taste their substance, has never left me.

The intense gardening experience that began in childhood has stayed with me through a career in botany, biochemistry, and medicine. And over the last 30 years, it has helped me mold my garden south of Ottawa into what it is today, an eight-acre patch of earth, home to a diverse collection of rare native and heirloom plants.

Carrigliath, as I call my garden—the

name is Gaelic for “gray stones,” which refers to the limestone rock that underlies the property—is run strictly on organic gardening principles. I use no synthetic chemical pesticides or fertilizers, relying instead on my own scientific background and experience to manage pests in a unique way.

Visitors to the garden are always astonished to find out that I maintain the garden organically. “No sprays, no pesticides?” they murmur to one another as they look at the blooming plants and dodge to avoid butterflies, bees, and birds. This did not happen overnight, of course; it has taken me a lifetime of experimentation with organic techniques and growing methods to achieve success.



## A PAINFUL LESSON

It is not by chance or whim that I garden organically. About 30 years ago while working in a laboratory, a drop of diluted pesticide landed on my wrist and produced a weeping chemical burn that lasted for months. This particular pesticide has, fortunately, since been banned from garden use. After this incident, I began to experiment with non-toxic chemicals as a means of pest control and discovered that there are many creative ways to maintain a beautiful garden without resorting to use of synthetic chemical pesticides and fertilizers.

As I learned more about how to garden in partnership with nature, I began to realize how urbanization has turned vast areas around our cities into a dead zone for insects, mammals, and songbirds. With that in mind, I developed a holistic system for garden planning, which I call bioplanning. With just a bit of thought, any gardener can use the basic philosophy and principles of bioplanning to create a garden that welcomes beneficial insects such as lady beetles, praying mantises, syrphid flies, green lacewings, and ant lions. In 1999, I distilled what I had learned from my gardening into a book: *Bioplanning a North Temperate Garden*.

Many gardeners use one or more of the techniques that I practice, but a greater synergy can be achieved when all the components are working together. In other words, the individual elements are less powerful than the sum of their parts.

## GETTING STARTED

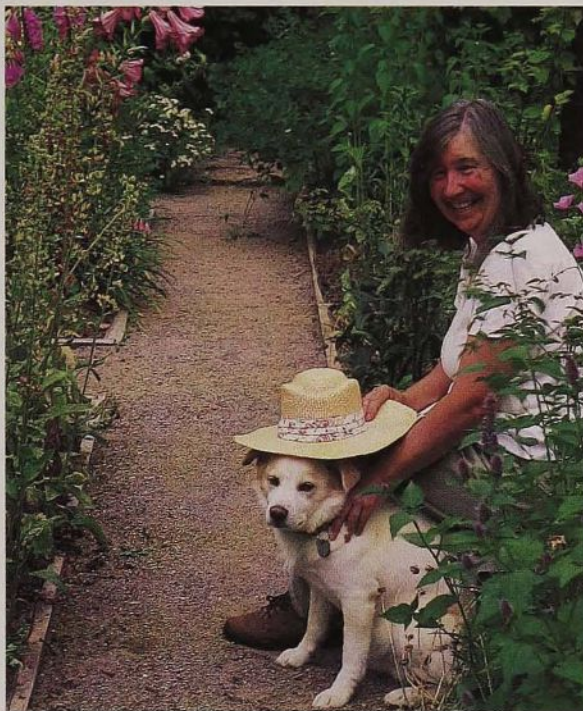
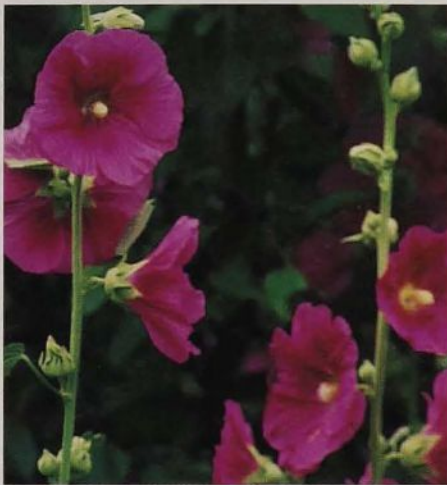
In 1973, when my husband, Christian, and I purchased the farmland that was to become Carrigliath, we started off with very impoverished farm soil. The original design of my garden came about partly by serendipity because in many cases I had to follow the logic dictated by the site. Open areas of meadow that served as feeding area for birds and host species for butterflies were retained. Because the underlying limestone comes close to the surface in some areas, the deep-rooted nut trees were limited to areas with deep soil.

But the design of a garden cannot be entirely based on logic and practicality.

For a garden to be a satisfying place, you have to invite beauty too. The remainder of the design of Carrigliath developed through my feeling for the symmetry between my knowledge of North American visual arts and the landscape before me.

## NURTURING HEALTHY SOIL

Soil is a complex living ecosystem that contains millions of diverse microorganisms critical to successful plant growth. Understanding and respecting the role of soil as a living ecosystem and nurturing it is the first stage of successful organic gardening.



**Top: One of the author's heirloom hollyhocks. Above: The author and her dog, Finnegan's Wake, share a relaxing moment in the North American medicine walk.**

The prescription for soil health is supplied by use of manures, compost, and mulches. I find that applying a yearly surface mulch of well-aged composted horse manure on all my garden beds is beneficial. I wait until perennials show their faces in spring and fill all the spaces in between plants with a few inches of manure or a blend of manure with wood chips. I try to make sure the manure does not come in contact with the emerging foliage, because that can promote fungal infections.

I also make a "super soil" mix for starting my annuals, perennials, and vegetables. I mix one-third garden soil with one-third compost or sphagnum peat, one-third aged horse manure and a sprinkling of bone meal. For plants that grow best in alkaline soils, I add some dry wood ash.

## ATTRACTING WILDLIFE

Feeding stations and bird houses scattered throughout a garden will invite insect-consuming birds such as house wrens, which adore garden pests such as earwigs and Japanese beetles. Be sure to leave open areas as "airways" for flight and sunny perching areas for grooming.

Providing safe havens for nesting and cover is also essential. In my garden, hedges serve this purpose, as well as providing the "walls" that separate different garden rooms. Diversely planted hedges also offer wildlife food from flowers and berries.

Having many sources of water available in a garden is critical to attracting beneficial wildlife. Open water, even a few bowls filled with water and lollipop stick floaters, will supply water to insects, butterflies, and birds. Bird baths should be placed out in the open, where there is safe perching, so that the shy songbird species can come too.

## DIVERSITY BEGETS DIVERSITY

Planting a diverse selection of flowers, shrubs, and trees brings in a corresponding diversity of insects, birds, amphibians, mammals, and other creatures dependent on them. Evaluate your overall garden—the more biodiversity you have, the better. For each different flower, shrub, or tree you add, you can expect an exponential increase in beneficial insects. In my garden, I have no-





ticed that the more rare plants I bring into the garden, the more unusual and new wildlife species there seem to be.

### KEEPING DISEASES AT BAY

Disease prevention is a key component of organic gardening. I keep my garden in perpetual quarantine—no plants come in without inspection and no soil comes in the gate without a clean bill of health.

I aim for natural disease and pest resistance in the plant species I grow. If a plant shows a tendency to disease, I try to identify the cause and make adjustments to the growing environment. If that fails, I collect seeds, germinate them, and test the resulting seedlings for disease resistance. The best of the best I keep.

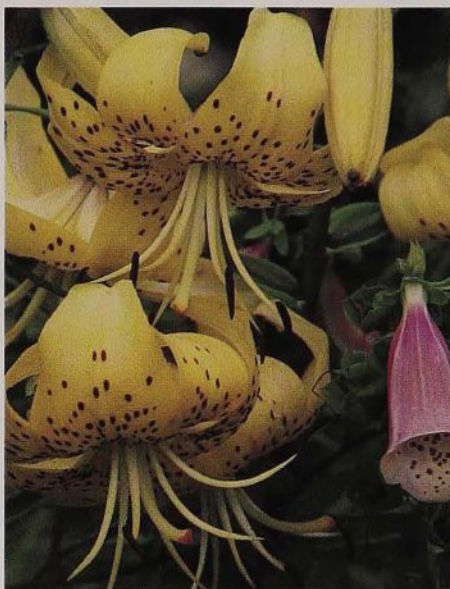
I also use a technique I call the ash bath to surface-sterilize bulbs, corms, tubers, and other bulbous roots that I am planting or transplanting. I dip the bulbs briefly in a bag filled with dry wood ash. After shaking off the excess powder, I plant the bulb and water it in immediately. The resulting solution of potassium hydroxide destroys fungal spores and places a protective chemical barrier in the soil between the plant and potential pathogens.

### FRAGRANCE

Another important element in a garden is fragrance. I say this not only because floral scents are nature's calling card to pollinating insects, but because being in close contact with fragrant flowers and herbs helps the gardener—and all those

who visit the garden—to relax and heal.

To this end, I recently incorporated a North American medicine walk, which is a garden within a garden. It has two enclosed walkways at each end like two small cloisters. Each walkway has a natural stone path with borders on both sides. American ginseng (*Panax quinquefolius*, USDA Zones 3–9, AHS Zones 9–1) grows with the wood poppy, (*Stylophorum diphyllum*, Zones 5–8, 8–1). Both are endangered species in Canada. Among the other medicinals are collections of evening primroses, including *Oenothera brachycarpa* (Zones 4–8, 8–1) and *O. odorata* (Zones 4–8, 8–1), and giant hyssops (*Agastache*



*Lilium auratum* 'Golden Splendor' and foxgloves mingle in the medicinal garden.



Waterlily leaves on the pond's surface offer shade for the goldfish population, left, and also provide a sunning spot for frogs, above.

spp.). The latter are crossing with abandon and creating interesting hybrids.

### HEIRLOOMS

I have several major collections of heritage plants—or heirlooms—including garden phlox, hellebores, hollyhocks, and peonies. My definition of an heirloom is a plant that has been used in gardens for more than 100 years and comes with a “provenance,” or known place of origin. Serious gardeners should always know from where their plants come, so I keep that information on all my plant tags, along with the name of the person who gave the plant to me, date of original planting, and general growing information.

The newest star among my peonies is *Paeonia lactiflora* 'Chocolate Soldier' (Zones 3–8, 8–1), which has black flowers that smell chocolatey. This rare cultivar was originally bred at the Canada Department of Agriculture Central Experimental farm in Ottawa and came to me through tissue culture by way of Cambridge University in England.

### TREE COLLECTION

At every turn in Carrigliath, remarkable species abound. Among the diverse collection of trees are many regionally rare species such as the northern cucumber tree (*Magnolia acuminata*, Zones 4–8, 8–2), the Shumard oak (*Quercus shumardii*, Zones 5–8, 8–1), and the hop-ash tree (*Ptelea trifoliata*, Zones 5–9, 9–5), also known as the sacred tree of the first nations. The flowers of this North American native have a strong honeysuckle fragrance.

A nut allée features a collection of nut-bearing hickory trees (*Carya* spp.) that is the most northerly on the American continent. These trees are the product of har-



diness trials and selections I have conducted over the years. Another unique tree is a butternut (*Juglans cinerea* 'Batesii', Zones 3–9, 9–1) that I bred myself. I named it to honor a local farmer who more than 100 years ago had the foresight to collect and plant the best of the wild butternuts.

## FLOWER BORDERS

Near the house, I placed the dancing form of the fragrance border, which is over 80 feet long and is in bloom from spring to fall. In spring, orange-red-flowered crown-imperial fritillaries (*Fritillaria imperialis* 'Rubra Maxima', Zones 5–9, 9–4) serve as a backdrop to daffodils such as *Narcissus* 'King Alfred' and many of the fragrant butterfly narcissus, like *N.* 'Cassata' and *N.* 'Colblanc.' Smaller daffodils such as *N. jonquilla* (Zones 3–9, 9–1), *N. tazetta* 'Canaliculatus' (Zones 3–9, 9–1), and *N. xodorus* (Zones 3–9, 9–1) cultivars 'Rugulosus' and 'Plenus' grace the border's front.

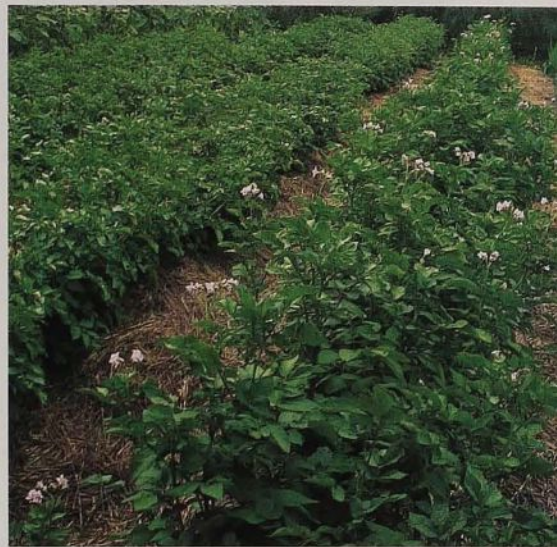
Planted nearby are a variety of lilies, including *Lilium* 'Copper King', *L.* 'Thunderbolt', *L.* 'Pink Perfection', and *L. regale* 'Album', that provide color in midsummer. As those begin to fade, galtonias, especially *Galtonia candicans* (Zones 7–10, 10–7)



**Above left:** The leaves of the American hop-ash tree are aromatic, and its flowers have a honeysuckle fragrance. **Above right:** A collection of heirloom potatoes in the vegetable garden.

and *G. princeps* (Zones 7–10, 10–7), hold their own into the late summer.

In the main summer border, I rely on *Clematis xdurandii* (Zones 4–9, 9–1) at the back for 12 weeks of continuous bloom. White, fragrant *C. recta* (Zones 3–7, 7–1) at the middle and front of the border is complemented by the regal purple and yellow Japanese iris (*Iris ensata*, Zones 3–9, 9–1).



## EDIBLES

A garden is always a work in progress, and this state of flux is probably most evident in the area where we have a vegetable garden, fruit-bearing plants, and tiny vineyard. This is the area in which Christian takes an abiding interest, and each winter and spring he and I endlessly debate our plan for the vegetables. Here we maintain our collection of heirloom potatoes and garlics, among many other vegetables.

The vegetable garden is divided by a permanent row of 'Mary Washington' asparagus, forming the 'Inside' and 'Outside' gardens. We have devised a four-year rotation plan for all the crops that helps keep these vegetables free of diseases and pests.

Becoming an organic gardener means embracing the philosophy of "think globally, act locally." We, the community of gardeners, must lead the way by rethinking what we are doing in our own gardens. We must learn how to bioplan for the sake of all the creatures both great and small within our stewardship. If we do this, I believe we shall begin to spin a silken thread of change that our children can weave into their lives.

## DIANA'S ORGANIC GARDENING TIPS

☘ To control weeds in new beds or to kill grass, I use a mulch made from the leaves of black walnut, butternut, or hickory trees, which contain a chemical called juglone that acts as a natural herbicide. (Note: Some plants are susceptible to juglone. Don't use this mulch around tomatoes, potatoes, pine trees, and rhododendrons.)

☘ Powdery mildew and other fungal diseases can be controlled by applying a solution of one level teaspoon of household baking soda in one quart of warm water to plant foliage. This is most effective if done early in the morning.

☘ Place small piles of leaves near or on south-facing walls or wood piles in the garden to start epicenters of lady beetles for the spring.

☘ Butterflies need access to water and to mineral salts, which help them maintain brilliant wing color, a defense against predation. One way to do this is to dampen a compost pile and leave it open to provide an area for butterflies to "puddle."

☘ When I top-dress flower beds, I prefer to use well-rotted sheep or horse manure rather than cow manure, which can promote the fungal disease called *Botrytis*.

☘ Lawns benefit from applications of ground dolomitic lime every three to five years. The lime helps neutralize acidic soil, promoting stronger grass roots.

*Diana Beresford-Kroeger lives and gardens at Carrigliath, her garden just south of Ottawa, Ontario. She is the author of Biopanning a North Temperate Garden, published by Quarry Press in 1999. Her next book, Arboretum America, will be released this fall by University of Michigan Press.*





# Waterwise Gardening

An efficient garden design can reduce water consumption and still yield spectacular results.

BY ETHNE CLARKE

EVERYWHERE YOU turn these days, someone is talking about drought and water restrictions. That's not surprising when, according to the Climate Monitoring Branch of the National Climatic Data Center in Asheville, North Carolina, slightly more than 50 percent of the contiguous United States by area suffered moderate to extreme drought conditions last summer. In Aurora, Colorado, where reservoirs are almost three-quarters empty, a complete ban on planting annuals, vegetables, and

new lawns has been imposed, at least until the end of this year. In St. Petersburg, Florida, residents are permitted to water their gardens only once a week—on a specific day, during designated hours.

Other cities, including Albuquerque, New Mexico, Las Vegas, Nevada, Santa Rosa, California, and Austin, Texas are offering incentive programs for waterwise landscaping, including a variety of rebates for elimination of lawns and/or installation of low water use plants and planting schemes.

Given the need for water conservation, today's gardeners—no matter where they live—must evaluate and devise appropriate design and planting strategies.

## ADVANCE PLANNING

When I arrived in Austin, Texas, five years ago, I made the decision to be actively waterwise. I was coming from England, which you might think has all the water it needs. Some areas do, but I had gardened in Essex, the driest county in England, where the renowned





**Opposite:** A side yard planting by Big Red Sun of Austin, Texas—a firm that specializes in xerophytic designs—includes gaura, rose campion, salvias, and sedums. **Above:** In the author’s backyard in Austin, a steppingstone path is framed by creeping thyme, dianthus, and silver-leaved herbs. Bearded irises add height.

British plantswoman Beth Chatto has her nursery and display gardens.

When Chatto converted a large gravel-topped parking area to a dry garden, she set the standard for waterwise gardening—at least in Europe. But her experience has much to teach us. One lesson I learned was to alter my expectations of the flower-filled border. The Chatto dry garden has no supplemental watering systems and can consequently look pretty bedraggled by midsummer. But by selecting plants for their mutual compatibility and xeric nature—their ability to survive prolonged periods of drought—and by following a program of judicious grooming and cutting back, the garden comes through its midsummer, drought-induced dormancy, springing back into life with the first early autumn rains.

This routine has translated well to my

central Texas garden, and the basic techniques of converting a water-thirsty, chemically maintained lawn to a waterwise landscape are appropriate no matter where you garden.

### START WITH A PLAN

Waterwise success depends upon suiting plants to both the site and each other, thereby creating self-sustaining plant communities. Many waterwise programs promote the use of native plants, and provide lists and cultural information to assist gardeners in the selection. But the plant palette can be extended to include adapted exotics, particularly perennials and ephemerals, to add a layer of form, color, and contrast to the garden picture.

One of the best guides I know to aid in the selection of drought-tolerant subjects is *Perennials and their Garden Habitats* by

Richard Hansen and Friedrich Stahl, the published findings of research by these two German plantsmen conducted during the last half of the 20th century. The book lists plants for a comprehensive range of cultural habitats, from damp shade to dry shade; wetland, steppe and rock garden and so on. As the authors note in their introduction: “...many perennials have a wide tolerance and it may be possible to use species from two or more different habitats together in a single planting...the trick is to arrange small groups of associated species within a unified background.”

This principle can be applied to a “water zoning” scheme recommended in an irrigation guide produced by the City of Albuquerque. In this plan, the “oasis zone” is the planting area immediately surrounding the house where the most water-dependant plants are located. Moving out into the landscape, the next planting area is the “transitional zone,” where plants that are moderately drought tolerant find a home. The final zone, at the garden perimeter, is “xeric,” for dependably drought-resistant plants.

This scheme can be adapted to any region, and the one that I followed when designing my Texas garden. I wanted a mix of native and adapted exotic plants, which meant that in addition to water-zoning, I also had to identify pre-existing microclimates. I pinpointed areas of dry shade and moist shade; areas where the soil was heavier and better suited to rose-growing; and free-draining, full-sun areas where herbs and Mediterranean perennials would be happiest.

### SITE PREPARATION

Remove existing turf by solarization (see “Harnessing the Sun,” page 16) or the use of translocating herbicides such as those containing glyphosate. In arid climates, let drought do the work for you. Dig the site over by hand, or use a tiller if you must. Remove any perennial weed roots and incorporate well-rotted compost as deeply as you can: a three-inch blanket of compost dug in to the top eight inches is a good guide, but add more if possible, especially on sandy soils. On heavy clay soils, add gravel or decomposed granite to the compost, which will improve the texture of the soil and help to prevent the damaging cycle of baking and cracking.





A circle of drought-tolerant buffalo grass surrounds a terrace in the author's back garden. At right, a metal trough that serves as a water garden sits amid a planting of drought-tolerant ferns.

I cannot recommend too strongly that you make your own compost from yard waste. An annual top-dressing in spring, lightly worked into the top few inches conditions the soil, introduces beneficial organisms that assist root growth and plant vigor, and encourages earthworm populations, which further condition the soil, enhancing its water-holding capacity.

## IRRIGATION

Parts of a waterwise garden, particularly the oasis zone, will need supplemental watering from time to time. Soaker hoses and rain barrels help make the most of your irrigation efforts. A soaker hose is porous all along its length, emitting water directly into the soil around the plants, so little evaporates.

Position rain barrels under gutter downspouts to use for emergency watering during prolonged drought and periods of water restriction. Water on a still day in early evening or early in the morning to give plants a chance to absorb the water: nothing makes less sense than watering at midday.

Rather than watering a little each day, water thoroughly once or twice a week: this way water percolates deeply into the soil, encouraging the plants to root deeply

into the soil. Remember, deeply rooted plants withstand dry spells better than plants that are shallowly rooted.

## MULCH

Covering bare soil around and between plants with a blanket of organic material conserves soil moisture, keeps root systems cool, and suppresses weeds. My personal favorite is coarsely ground wood chips because they do not form a tight mat, as some commercial shredded mulches do.

In the Southwest, where plants are adapted to soils that contain little organic matter, mulches like pebbles or rock grit make sense. Like their organic counterparts, inorganic mulches help prevent weeds, moderate soil temperature, and reduce surface evaporation.

Spread mulch in spring or fall when the soil is moist, taking care not to pile it up against the plants because this encourages rot.

## TACKLING DRY SHADE

Dry shade has always had the reputation as the most challenging area for garden-making. If you have dry shade, experiment to find out what will survive there. *Cyclamen* species, including spring-blooming *C. coum* (USDA Zone 5–9,

AHS Zone 9–5) and autumn-blooming *C. hederifolium* (Zones 7–9, 9–7) can form self-seeded ground-covering blankets of attractive heart-shaped foliage decorated with softly scented rose-pink flowers. The latter species does well in central Texas gardens.

Plants with fleshy root systems seem best able to withstand arid conditions. Winter and spring rains help hellebores such as *Helleborus niger* (Zones 4–9, 9–1) and Lenten rose (*H. x hybridus*, Zones 6–9, 9–6) establish a foothold in dry shade, enabling them to survive summer drought.

Another tough plant is lilyturf (*Liriope muscari*, Zones 6–10, 12–1), which makes dense clumps of straplike foliage with white to mauve flower spikes in early summer.

## FROM OASIS TO XERIC

The central area of my back garden lies in full sun and is occupied by a square terrace of native limestone slabs encircling a tranquil area of drought-resistant buffalo grass (*Buchloe dactyloides*, Zones 3–11, 12–2). The circle is circumscribed in limestone blocks. A steppingstone path leads from the house to the terrace.

The beds on either side of this path are planted with a mix of creeping thyme and dianthus cultivars, silver-leafed herbal plants like curry plant (*Helichrysum italicum* subsp. *serotinum*, Zones 7–11, 12–1), *Santolina pinnata* subsp. *neapolitana* (Zones 9–11, 12–9), *Artemisia* 'Canescens' (Zones 4–8, 8–1), and Mediterranean herbs such as rosemary, Greek oregano, and marjoram.

The flower spikes and strappy foliage from a collection of bearded iris cultivars give height and contrast to the planting, which is otherwise a patchwork blanket of silver gray and dark green foliage. Although this is a full-sun area, the ground covering plants supplement the mulch, and the beds are watered regularly to keep their oasislike freshness; after all, this is the entrance to the garden.

Nearby, in a shady corner against the house foundations, the soil is cool. This area does not drain quickly after rain and has been turned into an artificial "dry stream bed" by the addition of plenty of smooth river gravel and large smooth boulders—an attractive contrast to the buffalo grass circle. The stones make an ef-



# Regional Waterwise Gardens



**Midwest.** Drought-tolerant prairie natives are a good place to start when planning a waterwise garden in the Midwest. In this garden, native big bluestem grasses and black-eyed Susans cohabit happily with non-natives such as *Sedum* 'Autumn Joy' and feather reed grass.



**California.** Natives and plants from the Mediterranean region are well adapted to California's mild winters and dry summers. In this terraced garden, the dramatic form of a century plant provides a refreshing contrast to the fuzzier outlines of drought-tolerant herbs such as lavender, salvias, pinks, and California poppies.



**Pacific Northwest.** Although we tend to think of the Northwest as perennially rainy, summers are dry in many parts because of "rain shadows" from the mountains. In this waterwise garden, Mediterranean plants such as santolina, lavender, and lamb's-ears mingle with Russian sage. A thirstier rose benefits from spillover from the birdbath.



**Mid-Atlantic.** With many areas of the East Coast under water restrictions last summer, gardeners who had established drought-tolerant plantings were rewarded for their foresight. In this Connecticut garden, low-growing sedums, pinks, juniper, and blue fescue soften the look of a rock outcrop.

TOP LEFT AND RIGHT: DAVID CAVAGNARO; BOTTOM LEFT: LYNNE HARRISON; BOTTOM RIGHT: KAREN BUSSOLINI



fective weed-smothering, moisture-retaining mulch. It is slowly being colonized by a mix of ferns, including southern maidenhair fern (*Adiantum capillus-veneris*, Zones 8–11, 12–8), lady fern (*Athyrium filix-femina*, Zones 4–9, 9–1), and its recently introduced sport, ‘Lady in Red’, which has soft apple-green foliage and ruby red stems. Japanese painted fern (*Athyrium nipponicum* ‘Pictum’, Zones 5–8, 8–1) makes a silvery splash in the shadows.

Beyond these small formal areas nearest the house, the garden devolves into the transitional water zone and a wilder mix

*tenuis*, Zones 3–8, 8–1) is doing the best.

Various salvias are the backbone of the transitional zone. This useful genus gives scent, flowers, and in some cases, foliage interest, while the loose habit blends with neighboring plants, knitting the planting scheme together. *Salvia darcyi* (Zones 5–9, 9–5) is a robust sage with lipstick pink flowers and pretty crinkled foliage, good in sun or part shade. *S. madrensis* (Zones 6–9, 9–5) grows to five feet given the chance, with long spikes of bright yellow flowers. *S. guaranitica* ‘Black Knight’ (Zones 7–10, 12–8) is medium height with dark violet-blue flowers and pleasing



In the author's front garden, a mix of native and adapted exotic plants coexist successfully in dry heat and sun without requiring supplemental watering.

of plants chosen for their good foliage, as limited water is not conducive to lavish flowering. A “short-short list” of the best would include feather grasses (*Stipa* spp.), which are incredibly durable, and as graceful as their relative, the Mexican feather grass (*Nasella tenuissima*, Zones 7–11, 12–7). Shrublike Jerusalem sage (*Phlomis fruticosa*, Zones 8–9, 9–8) and *Artemisia* ‘Powis Castle’ (Zones 6–9, 9–6), along with some heritage roses—particularly the hybrid Musks ‘Penelope’ and ‘Georgetown Tea’—are true stalwarts even when parched, as are bamboo muhly (*Muhlenbergia dumosa*, Zones 8–12, 10–5) and several species of penstemon. Of these last, the Gulf Coast penstemon (*Penstemon*

anise-scented foliage. For a full rundown on salvias, pick up a copy of Betsy Clebsch's *The New Book of Salvias*.

This being a central Texas garden, I have of course planted agaves, yuccas, and other hardy succulents and cacti. Their sculptural forms add another layer of interest and fill the gap between transitional zones and the xeric fringe of the garden.

### JUST DO IT

Xeriscape, despite all its trademarking and commercial promotion, has come to mean zero-scape to some gardeners, who understand a xeric landscape as an empty wasteland of sun-baked gravel and hostile cacti. This is part of the reason terms

## Resources

Many botanical gardens, public parks, and regional horticultural organizations promote ecologically friendly gardening and can be good sources of educational material and inspiration. And don't forget to check the Internet to access countless information sites related to xeriscaping and water conservation..

**Native Gardens for Dry Climates** by Sally Wasowski with Andy Wasowski. Clarkson Potter Publishers, New York, 1995.

**Natural by Design: Beauty and Balance in Southwest Gardens** by Judith Phillips. Museum of New Mexico Press, Santa Fe, 1995.

**The Undaunted Garden: Planting for Weather Resilient Beauty** by Lauren Springer. Fulcrum, Golden, Colorado, 1994.

**Water-Wise Gardening: America's Backyard Revolution** by Thomas Christopher. Simon and Schuster, New York, 1994.

**Xeriscape Handbook : A How-To Guide to Natural, Resource-Wise Gardening** by Gayle Weinstein. Fulcrum Publishing, Golden, Colorado, 1998.

like “waterwise” and “Mediterranean style” have come into use: They represent an effort to make water conserving landscaping more appealing.

It's time to move on, stop agonizing over what we call it, and simply garden. By embracing water conserving practices and appropriate plant selection and placement, the reward is an appealing, efficient landscape that accommodates water restrictions with ease and grace.

*Ethne Clarke is author of many gardening books, including Herb Garden Design, recently re-released by Antique Collector's Club. She has just been named garden editor of Traditional Home magazine.*



## SEASONAL GARDEN GOODS

*As the hot summer months arrive and many communities face water restrictions, water conservation becomes increasingly important. Here are some products to help you save water and money.*



Collect chemical-free water for your garden with the compact **RainCatcher** barrel. Each 54-gallon container includes a linking kit so you can add more barrels as needed. Made of 25 percent recycled plastic, each barrel features a child-safety lid, and a mesh screen to prevent accumulation of debris. Retail for \$119. Gardener's Supply Company. (800) 427-3363. [www.gardeners.com](http://www.gardeners.com).

Newly planted trees need to be regularly watered until they become established. The **WaterRing** provides a constant supply of water for about two weeks, depending on environmental conditions. Each 23-inch UV-resistant plastic ring can be filled with up to 5 gallons of water; it can also be connected to an irrigation system. Available for \$18.95 from Lee Valley Tools, Ltd. (800) 871-8158. [www.leevalley.com](http://www.leevalley.com).



The trigger function of the **Touch 'N Flow Rain Wand** makes it a snap to shut off the water or control water pressure to produce a gentle shower that won't damage delicate plants or disrupt the soil. Its ergonomic, cushioned grip makes hand-watering comfortable. Available in assorted fun colors. A 30-inch wand retails for \$19.98 from Dramm. (920) 684-0227. [www.dramm.com](http://www.dramm.com).



Watering hard-to-reach areas of your garden is no longer a problem with the **Noodlehead** sprinkler. Its 12 flexible nozzles can be bent in any direction to target water where you need it, up to 15 feet away. Sells for \$19.95. An optional Extend-A-Riser (\$11.95) holds the sprinkler above tall vegetation. Charley's Greenhouse & Garden. (800) 322-4707. [www.charleysgreenhouse.com](http://www.charleysgreenhouse.com).

Products profiled are chosen based on qualities such as innovative design, horticultural utility, and environmental responsibility; they have not been tested by the American Horticultural Society. Send new product information to New Products, *The American Gardener*, 7931 East Boulevard Drive, Alexandria, VA 22308, or e-mail to [editor@ahs.org](mailto:editor@ahs.org).

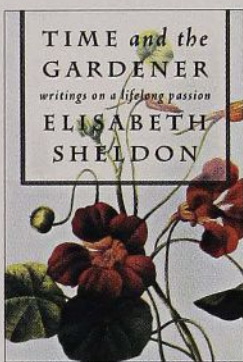


## Recommendations for Your Gardening Library

### **Time and the Gardener: Writings on a Lifelong Passion.**

Elisabeth Sheldon. Beacon Press, Boston, 2003. 276 pages. Publisher's price, hardcover: \$25.

IS THE columbine 'Norah Barlow' a horror? Should all double shasta daisies except 'Wirral Pride' and 'Aglaya' be banished? What a delight to encounter a writer who doesn't blandly claim that all plants are created equal. If a plant rampantly self sows, smothers its neighbors, or requires superhuman effort to grow, Elisabeth Sheldon tells you so. She also describes plants that seem so desirable, one is tempted to throw down the book and immediately go in search of them. Sheldon is opinionated, knowledgeable, generous, and witty—just the sort of garden companion most of us long for.



This collection of literate and informative essays is divided into three parts: What I've Learned Over Time; Timeless Plants—Some of My Favorites; and Gardeners of Other Times. They distill a lifetime of gardening experience combined with an artist's awareness of plants and their surroundings.

Her discussion on gardening with purple foliage will make you think about your garden combinations in a new and more sensitive way. That ability to make you rethink your assumptions and really see what is in front of you is worth the price of the book. In addition, her essays on 18th- and 19th-century gardeners are gentle reminders of the obstacles women once faced and the fact that gardening is not for the simpering and faint hearted.

*Time and the Gardener* is perfect for rainy days and cold winter evenings—not a lavish picture book, but a collection of vividly written essays that will amuse you and change the way you think about gardens and plants. You will return to it over and over to refresh your vision and increase your knowledge.

—Norma Prendergast

*Norma Prendergast is an art historian and garden writer who lives in Ithaca, New York.*

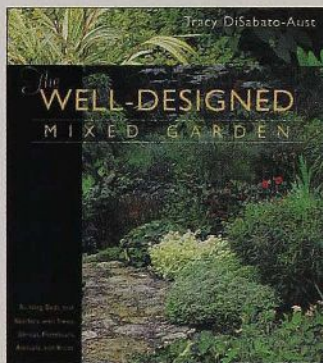
### **The Well-Designed Mixed Garden: Building Beds and Borders with Trees, Shrubs, Perennials, Annuals, and Bulbs.**

Tracy DiSabato-Aust. Timber Press, Portland, Oregon, 2003. 460 pages. Publisher's price, hardcover: \$39.95.

I'VE NEVER understood people who have a themed garden—a garden that consists only of plants with silver foliage, for in-

stance, or only Mediterranean or tropical plants. To me, gardening means never having to say "no." I want to grow *everything*. Fortunately, Tracy DiSabato-Aust agrees. Her new book is a gorgeous and practical guide to having it all.

She covers the basics of garden design as they apply to a mixed border, addressing design principles, plant selection, maintenance needs, and light and water requirements. But the most amazing thing is that she does it in such a conversational style. She writes informally, in the first person, making this one of those rare design books that you can read from beginning to end like a novel.



In her chapter on color in the garden DiSabato-Aust talks about value, intensity, and hue with the expertise of a painter, and she has included a plant-based color wheel (chartreuse foliage in the light green section contrasts perfectly with the magenta tulips directly across the wheel). I found myself mentally rearranging my own garden as I read about analogous, complementary, and triadic color schemes.

Her approach is precise and technical, but never intimidating. Best of all, almost all of her ideas work in small gardens like mine, not just in expansive borders and botanical gardens.

*The Well-Designed Mixed Garden* is one of those enormous and comprehensive works that is equally at home on your coffee table or out in the potting shed, where you can page through it as you plant. Generous appendices of plant lists, color charts, and diagrams make the book an essential reference tool.

—Amy Stewart

*Amy Stewart is the author of From the Ground Up: The Story of a First Garden.*

### **Climbing Gardens: Adding Height and Structure to Your Garden.**

Joan Clifton. Special photography by Steven Wooster. 144 pages. Firefly Books, Buffalo, New York, 2003. Publisher's price, softcover: \$19.95.

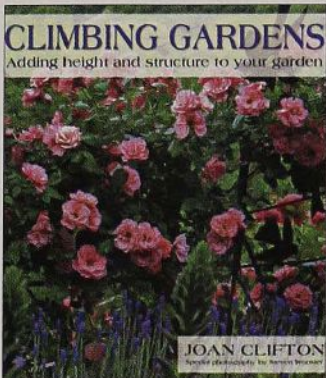
JOAN CLIFTON promises that adding the third dimension of height will transform a garden "from a flat palette into a theatrical experience." Consider how just as a handful of props transforms a stage; in the same way, a trellis, obelisk, arbor, or pergola can energize a border full of knee-high plants, contributing scale, privacy, or perhaps a focal point to a design.

Think "climber" and the first image that springs to mind



may be a rustic, rose-covered arbor, but the excellent photos that fill the pages of this book show a very broad range of styles, from romantic cottage to formal contemporary, kitchen garden to meadow, home-made to elaborately wrought. The gardens are of every size, too—from tiny urban balconies to grand estates—with many ideas that are adaptable to suburban properties. Sometimes the support visually disappears and the plants take center stage. At other times, the structure itself, possessed of a bold color or shape, captures the attention, becoming a form of functional sculpture.

Clifton's London-based company, Avant Garden, specializes in wrought-iron and wirework forms for topiary, and examples are scattered throughout *Climbing Gardens*. These



designs are among the most intriguing in the book, perhaps because they are not the typical off-the-shelf (or out-of-the-catalog) examples we've all seen.

The book offers both inspiration and information, with several spreads detailing projects, including how to fabricate a formal wooden obelisk, a living willow arbor, a rustic gazebo, and a free-form wire support for a vine.

Clifton's text is thorough, offering some history, design theory, how-to, and why-to. But the photography is the most appealing part of the book. With more than 150 images, the book invites browsing and the application of sticky notes to multiple pages. A brief plant encyclopedia reviews how different plants climb—with terrific close-up photos—and offers thumbnail sketches of the top herbaceous perennial, woody, annual, and tender climbers.

—Renée Beaulieu

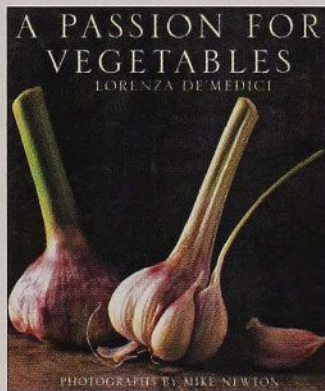
*Renée Beaulieu, Internet editor for White Flower Farm Nursery, added trellises to her small garden when she realized this allows her to jam even more plants into a small space.*

## GARDENER'S BOOKS

### Noteworthy New Titles on Food Gardening

**T**HICK SLICES OF plump, sun-ripened tomatoes, just off the vine. A savory pesto whipped up from your own fresh herbs. An apple plucked from the tree, bursting with juice and sweet-tartness. Is your mouth watering yet? Growing your own vegetables, herbs, and fruit can be very satisfying, not to mention flavorful. By growing your own, you can select the exact varieties you want and not have to worry about what might have been sprayed on your produce. Even if you don't grow your own, you can share the thrill of fresh produce by investigating local farmers' markets. Lots of new books designed to help and inspire your edible gardening activities have hit the shelves recently. Here are a few we found particularly delicious.

*A Passion for Vegetables* by Lorenza de'Medici (Pavillion Books, 2003, \$35) will inspire you, with its color drenched, still life photographs by Mike Newton and its gourmet Italian recipes. Many, like gingered cucumber salad and grilled radicchio with anchovies, pair unusual flavors. In addition to typical garden veggies—tomatoes, lettuce, beans—de'Medici includes several less familiar selections such as dandelion, cardoon, and celeriac.



You can learn how to grow your vegetables, fruit, and herbs without chemicals, by consulting *Rodale's Illustrated Encyclopedia of Organic Gardening*, edited by Pauline Pears (DK Press, 2002, \$40). Topics include soil care, weed control, gardening for wildlife, container gardening, and much more. Particularly helpful is the "A-Z of Plant Problems," which covers diseases and pests, susceptible plants, and prevention and control techniques.

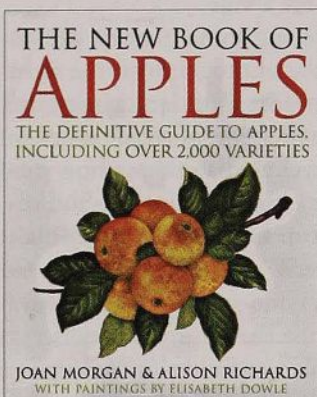
*Gourmet Vegetables*, edited by Anne Raver (Brooklyn Botanic Garden, 2002, \$9.95) is a little book with a lot of information. Essays include "The Rewards of Regionally Grown Foods," "Growing the Winter Harvest," and "Experimenting with Ancient Crops." Most of the book, however, is dedicated to individual vegetables—selecting varieties, how to grow them, and how to use them.

If space is a constraint, check out *The Bountiful Container* by Rose Marie Nichols McGee and Maggie Stuckey (Workman Publishing, 2002, \$16.95). The authors provide lots of practical advice on getting the most out of your available space, both in terms of edible produce and visual appeal. Individual vegetables, herbs, fruit,



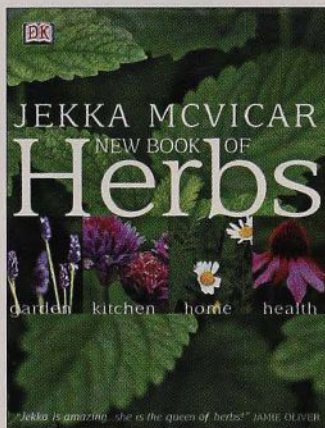
and edible flowers that are adaptable to container culture—and there are many more than you ever thought—are covered. Interspersed among the plant discussions are recipes, both for colorful container combinations, and for culinary treats.

On the other hand, if you've space for a few trees—and an interest in flavors beyond 'Granny Smith' and 'Red Delicious'—



—*The New Book of Apples: the Definitive Guide to Apples, Including Over 2,000 Varieties* by Joan Morgan and Alison Richards (Ebury Press, 2002, \$55) is definitely worth consulting. This revised edition of a book first published in 1993 includes some 100 new varieties accessed in the last 10 years, as well as fresh details on many older varieties. The history of the apple, addressed in the first

part of the book, makes surprisingly interesting reading, and is illustrated with paintings by Elisabeth Dowle and numerous historic drawings and photographs. The second part, "Directory of Apple Varieties," is an extensive listing, complete with origin and descriptions, of both old and new varieties.



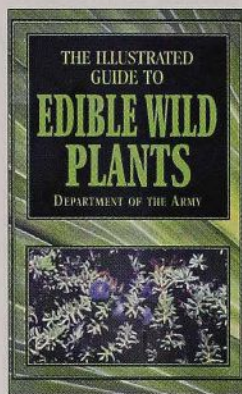
Jekka McVicar's *New Book of Herbs* (DK Publishing, 2002, \$30) tells you how to grow, harvest, preserve, and use herbs. In addition to an extensive section about culinary herbs, McVicar demonstrates how these most useful plants have a place throughout the house, as cleaners, fragrances, first aid, beauty treatments, and for relaxation and pet care. Her discussion of the "Top 100 Herbs" is organized

for easy access, providing information on propagation, site, maintenance, harvesting, and uses.

*A Celebration of Herbs: Recipes from the Huntington Herb Garden*, edited by Peggy Park Bernal, Judith Herman, and Jean Patterson (Huntington Library Press, 2003, \$29.95) is based on the lectures of Shirley Kerins, curator of the Huntington Herb Garden. Innovative recipes for using herbs in breads, main dishes, side dishes, jams, desserts, and beverages are accompanied by interesting tidbits about herbal folklore, herbs in literature, and herbal medicines.

If you think vegetable gardens should be hidden out back, out of view, think again. Susan J. Pennington's *Feast Your Eyes: the Unexpected Beauty of Vegetable Gardens* (University of California Press, 2002, \$29.95) is sure to change your mind. Pennington examines vegetable garden style, how it has developed and changed through history, from the Ming Dynasty in China, to the elaborate vegetable gardens of 17th-century Europe, and the Victory Gardens of World Wars I and II in the United States. The 100 photographs and paintings—

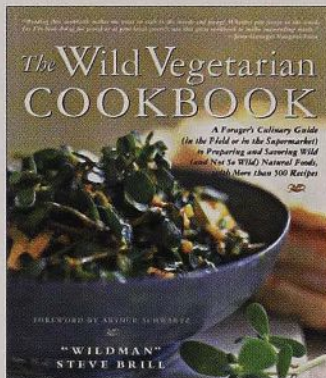
both historic and contemporary—trace these changes, and illustrate how ornamental vegetable garden design has come full circle, influencing home vegetable gardens today. This is not a how-to book, but one that is sure to inspire.



A garden isn't the only place where edible plants grow. For naturalists, campers, and those of us who are simply curious about foraging, comes a Department of the Army publication, *The Illustrated Guide to Edible Wild Plants* (Lyons Press, 2003, \$14.95). Did you know that the rhizomes of cattails are a rich source of starch or that the fruit of bearberry can be eaten raw or cooked, and that the young leaves yield a refreshing tea? This book presents lots of familiar plants in a new light. You

will learn that, if you really had to, you could eat crunchy reindeer moss or steamed plantain leaves, or you could brew a coffee substitute from beech nuts. Photographs help you identify your dinner. The book also includes a section on poisonous plants that you'd best avoid.

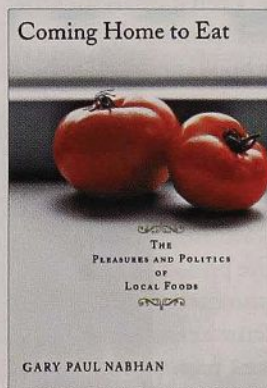
Recipes for using your foraged plants are presented in abundance in *The Wild Vegetarian Cookbook* (Harvard Common Press, 2002, \$29.95)



The subtitle pretty much says it all: "A Forager's Culinary Guide (in the Field or in the Supermarket) to Preparing and Savoring Wild (and Not so Wild) Natural Foods, with More than 500 Recipes." Among the intriguing recipes are dandelion fried rice, milkweed biryani, and pasta with cattails. Written by "Wildman" Steve Brill, who has

been guiding foraging tours in, of all places, New York City, since 1982, this entertaining tome will have you examining your weeds with a fresh perspective.

Completing our survey of nifty edible gardening books is one that investigates where our food comes from, and how local foods relate to the development of regional culture. *Coming Home to Eat: the Pleasures and Politics of Local Foods*, by Gary Paul Nabhan (Norton, 2002, \$24.95), is based on the author's first hand experience. For a year, Nabhan limited his food intake to that which was grown, raised, or foraged within a 200 mile radius of his home in Arizona. By exploring local markets and farms, he discovered many unusual foods, experienced successful local farming operations, and re-established a connection between food and life.



—Rita Pelczar, Associate Editor





## REGIONAL HAPPENINGS

# Horticultural Events from Around the Country

### NORTHEAST

CT, MA, ME, NH, NY, RI, VT

JULY 12–AUG. 31. **Plants of the World.** Self-guided tour on the uses of plants in different cultures. Brooklyn Botanic Garden. Brooklyn, New York. (718) 623-7200. [www.bbg.org](http://www.bbg.org).

JULY 19. **Garden Furniture Design.** Workshop. (Requires power tools.) Berkshire Botanical Garden. Stockbridge, Massachusetts. (413) 298-3926. [www.berkshirebotanical.org](http://www.berkshirebotanical.org).

AUG. 3, 10, 17, & 24. **Summer Gardening Series.** Lectures on various gardening ideas and techniques. New England Wild Flower Society. Garden in the Woods. Framingham, Massachusetts. (508) 877-7630. [www.newfs.org](http://www.newfs.org).

AUG. 8–10. **Northeast Organic Farming Association's 29th Annual Summer Conference.** Features workshops and entertainment for children and adults. Hampshire College. Amherst, Massachusetts. (978) 355-2853. [www.nofamass.org](http://www.nofamass.org).

AUG. 16 & 17. **Butterfly Weekend.** Tours, garden walks, and art lessons. Wave Hill. Bronx, New York. (718) 549-3200. [www.wavehill.org](http://www.wavehill.org).

#### Looking Ahead

SEPT. 13 & 14. **Centennial Symposium: "Celebrating a Century of Connecticut Flora."** Workshops and field trips to observe the 100th anniversary of the Connecticut Botanical Society. Connecticut College. New London, Connecticut. (860) 873-9187. [www.ct-botanical-society.org](http://www.ct-botanical-society.org).

### MID-ATLANTIC

PA, NJ, VA, MD, DE, WV, DC

**AHS** JULY 24–26. **2003 National Children & Youth Gardening Symposium.** Workshops, lectures, and tours. American Horticultural Society. River Farm. Alexandria, Virginia. (703) 768-5700. [www.ahs.org](http://www.ahs.org).

JULY 26–SEPT. 21. **Feast Your Eyes: The Unexpected Beauty of Vegetable Gardens.** Exhibit traces the history of vegetable gardens with images and documents from the Smithsonian's Archives of American Gardens. Lewis Ginter Botanical Garden. Richmond, Virginia. (804) 262-9887. [www.lewisginter.org](http://www.lewisginter.org).

Events sponsored by or including official participation by AHS or AHS staff are identified with the **AHS** symbol.

JULY 29–31. **Penn Allied Nursery Trade Show.** Pennsylvania Landscape & Nursery Association. Fort Washington Expo Center. Fort Washington, Pennsylvania. (717) 238-1673. [www.plna.com](http://www.plna.com).

AUG. 1. **Elegant Edible Flowers.** Demonstration on harvesting, cleaning, storing, and using edible flowers. U.S. Botanic Garden. Washington, DC. (202) 225-8333. [www.usbg.gov](http://www.usbg.gov).

AUG. 8–10. **Koi America: The Nation's Largest Pond and Water Garden Expo.** Mid-Atlantic Koi Club. Dulles Expo & Conference Center. Chantilly, Virginia. (703) 791-5939. [www.makc.com](http://www.makc.com).

**AHS** AUG. 9. **Saturday Hort-Takes Children's Program: A Card to Plant.** Children's workshop on how to recycle paper to make a card that can be planted. American Horticultural Society. River Farm. Alexandria, Virginia. (703) 768-5700. [www.ahs.org](http://www.ahs.org).

AUG. 22. **Principles of Plant Propagation: Heirloom Plants.** Demonstration. U.S. Botanic Garden. Washington, DC. (202) 225-8333. [www.usbg.gov](http://www.usbg.gov).

**AHS** AUG. 29. **Saturday Hort-Takes Children's Program: Seed Magnets.** Children's

workshop on how to create a magnet using seeds. American Horticultural Society. River Farm. Alexandria, Virginia. (703) 768-5700. [www.ahs.org](http://www.ahs.org).

AUG. 30 & 31. **Maryland State Fair Dahlia Show.** Maryland State Fairgrounds. Timonium, Maryland. (301) 368-3316. E-mail: [dahliafan@hotmail.com](mailto:dahliafan@hotmail.com).

#### Looking Ahead

**AHS** SEPT. 13. **Saturday Hort-Takes: Drying Herbs & Flowers.** Workshop. American Horticultural Society. River Farm. Alexandria, Virginia. (703) 768-5700. [www.ahs.org](http://www.ahs.org).

SEPT. 13. **Backyard Invaders: Plants In and Out of the Garden.** Seminar. Delaware Center for Horticulture. Wilmington, Delaware. (302) 658-6262. [www.dehort.org](http://www.dehort.org).

### SOUTHEAST

AL, FL, GA, KY, NC, SC, TN

JULY 26 & 27. **Tropical Fruit Festival.** Sunken Gardens. St. Petersburg, Florida. (727) 551-3100. [www.stpete.org/rec/parks\\_pages/sunkengardens.htm](http://www.stpete.org/rec/parks_pages/sunkengardens.htm).

JULY 30–AUG. 2. **Southern Nursery Association Researcher's Conference and Trade Show.** Georgia World Congress Center. Atlanta, Georgia. (770) 953-3311. [www.sna.org](http://www.sna.org).

#### Looking Ahead

SEPT. 11–13. **The Southern Plant Conference.** Southern Nursery Association. Charleston,

## Invasive Plants Conference in Philadelphia

PROTECTING AMERICA'S native flora from the threat of invasive plants is a growing concern throughout the horticultural industry. On August 6 and 7, the 2003 Invasive Plants Conference at the Morris Arboretum in Philadelphia will provide a forum to address the issue of invasive plants and come up with effective solutions for controlling them.

Researchers estimate that more than 50,000 plant species have been introduced into North America, some of which are invading natural areas and diminishing the biodiversity of native ecosystems. This two-day seminar brings together experts from fields such as horticultural research, landscape design, public education, and grounds management to discuss control strategies for invasive plants as well as ethical concerns over their future use and introduction.

For more information about the conference, or to register, call (215) 247-5777 ext. 159, or visit the Web site at [www.upenn.edu/paflora](http://www.upenn.edu/paflora).

—Pia daSilva, Editorial Intern



## Reynoldsburg, Ohio, Ripens for Tomato Festival

DO YOU SLATHER your food in ketchup? Is your favorite part of a BLT the "T?" For all of you tomato-lovers out there, mark your calendars for the 38th Annual Reynoldsburg Tomato Festival. The theme of this year's festival, "Celebrating 200 Years of Ohio," pays homage to the humble roots of both the tomato and the state of Ohio.

From September 3 to 6, the people of Reynoldsburg (located 12 miles east of Columbus) will gather to celebrate their town as "The Birthplace of the Tomato" and recognize Alexander W. Livingston (1821-1898) for his successful development of the first commercial tomato, the Paragon.

The highlights of the festival are the tomato pageants and the crowning of the tomato royal court, but don't miss seeing the tallest tomato plant and largest-tomato contest winners or the motorcycle cruise-in on September 6. The experience wouldn't be complete without buying fresh tomatoes, sampling free tomato juice, or watching the Grand Parade on September 7 after the conclusion of the four-day event. With lots of good food, rides, arts and crafts, and free nightly entertainment, the Reynoldsburg Tomato Festival offers something for the whole family.

Not too far from the festivities is the historic Livingston House Museum, where the Livingston Seed Company got its start. Livingston's 17th-century Victorian home has been restored and furnished with period objects, furniture, and clothing. The grounds feature an 1800s flower clock as well as tomato, herb, and vegetable gardens. The Livingston House, which is listed on the National Register of Historic Places, is open to the public by appointment only.

For more information on the Reynoldsburg Tomato Festival, call (614) TOMATO-1 or (614) 866-2861 or e-mail [tomatofestival@aol.com](mailto:tomatofestival@aol.com). To schedule a tour of the Livingston House, contact the Reynoldsburg Parks and Recreation Department at (614) 866-6188.

—Daphne Rozen, special to The American Gardener



The crowning of the Tomato Queens is one of the highlights of the Reynoldsburg Tomato Festival.

South Carolina. (770) 953-3311. [www.sna.org](http://www.sna.org).

SEPT. 10. **Medicinal Plants of the Southern Appalachian Mountains.** Workshop. Atlanta Botanical Garden. Atlanta, Georgia. (404) 876-5859. [www.atlantabotanicalgarden.org](http://www.atlantabotanicalgarden.org).

SEPT. 25-27. **Conference on Restoring Southern Gardens and Landscapes.** Old Salem. Winston Salem, North Carolina. (336) 721-7338. [www.oldsalem.org](http://www.oldsalem.org).

### NORTH CENTRAL

IA, IL, IN, MI, MN, ND, NE, OH, SD, WI

JULY 19. **A Day in the Garden and Garden Thyme Market.** Garden tour and gardening goods sale. Thornapple Garden Club of Hastings. Courthouse Lawn. Hastings, Michigan. (269) 945-2986. E-mail: [crafterladybarb@hotmail.com](mailto:crafterladybarb@hotmail.com).

JULY 20. **45th Annual Dearborn Garden Walk**

**and Heritage Festival.** A self-guided tour of 20 private award-winning rear gardens on Chicago's Gold Coast. North Dearborn Association. Chicago, Illinois. (312) 632-1241.

JULY 31-AUG. 3. **Easy Being Green: American Community Gardening Association's 24th Annual Conference.** Workshops, lectures, panel discussions, and garden tours. Chicago, Illinois. (718) 623-7251. [www.communitygarden.org](http://www.communitygarden.org).

AUG. 9. **A Garden for All Seasons: Summer Walk.** Guided tour. Olbrich Botanical Gardens. Madison, Wisconsin. (608) 246-4500. [www.olbrich.org](http://www.olbrich.org).

AUG. 9 & 10. **Pepper Festival.** Features sweet and hot peppers from around the world. Chicago Botanic Garden. Glencoe, Illinois. (847) 835-5440. [www.chicagobotanic.org](http://www.chicagobotanic.org).

AUG. 13. **65th Annual Nisswa Garden Club Flower and Garden Show.** Nisswa Garden

Club. Lutheran Church of the Cross. Nisswa, Minnesota. E-mail: [jinnm@uslink.net](mailto:jinnm@uslink.net).

### SOUTH CENTRAL

AR, KS, LA, MO, MS, OK, TX

AUG. 8. **Town and Country Fair Rose Show.** Tri-County Rose Society. Exhibitors Building. Washington Fairgrounds. Washington, Missouri. E-mail: [wweirich@yhti.net](mailto:wweirich@yhti.net).

AUG. 15. **Midwest Bonsai Society Show & Sale.** Chicago Botanic Garden. Glencoe, Illinois. (847) 835-5440. [www.chicagobotanic.org](http://www.chicagobotanic.org).

AUG. 13-16. **Landscape Design Short Course.** Workshops. Mississippi State University Extension Service. Crosby Arboretum. Picayune, Mississippi. (601) 799-2311. [www.msstate.edu/dept/crec/camain.html](http://www.msstate.edu/dept/crec/camain.html).

AUG. 22-24. **5th Annual Fall Texas Home & Garden Show.** Henry B. Gonzalez Convention Center. San Antonio, Texas. (713) 529-1616. [www.TexasHomeandGarden.com](http://www.TexasHomeandGarden.com).

### Looking Ahead

SEPT. 15. **Orchidaceous Art.** Orchid display. Crystal Bridge. Myriad Botanical Gardens. Oklahoma City, Oklahoma. (405) 297-3995.

### SOUTHWEST

AZ, NM, CO, UT

JULY 17. **Red Butte Garden Walk: Roses.** Red Butte Garden. University of Utah. Salt Lake City, Utah. (801) 581-4747. [www.redbuttegarden.org](http://www.redbuttegarden.org).

AUG. 16. **Mushroom Walk.** Topic walk. The Arboretum at Flagstaff. Flagstaff, Arizona. (928) 774-1442. [www.thearb.org](http://www.thearb.org).

AUG. 27 & 28. **10th Annual Maricopa County Summer Short Course: Invasive Plant School.** University of Arizona. Phoenix, Arizona. (602) 470-8086 ext. 314. [www.cals.arizona.edu](http://www.cals.arizona.edu).

### WEST COAST

CA, NV, HI

JULY 19. **Aquatic Gardens: Lessons from Lotusland.** Water gardening workshop and walking tour. The Huntington Botanical Gardens. San Marino, California. (626) 405-2128. [www.huntington.org](http://www.huntington.org).

JULY 25-27. **Earthly Paradise: Historic Gardens of the San Francisco Peninsula.** Lectures, luncheon, and garden tours. Stanford University. Palo Alto, California. (831) 722-6836. [www.cgths.org](http://www.cgths.org).

AUG. 8-10. **Winter Gardening and Seed Saving.** Class. Occidental Arts and Ecology Center. Occidental, California. (707) 847-1557



ext. 201. E-mail: [oaec@oaec.org](mailto:oaec@oaec.org).

JULY 27–AUG. 3. **2003 Perennial Plant Symposium.** Seminars, lectures, and a trade show. Perennial Plant Association. Symposium from July 27 to 31 at Sacramento Convention Center, Sacramento, California. Garden tours from August 1 to 3 in San Francisco. (614) 771-8431. [www.perennialplant.org](http://www.perennialplant.org).

AUG. 30. **Succulent Plants Symposium.** The Huntington Botanical Gardens. San Marino, California. (626) 405-3504. [www.huntington.org](http://www.huntington.org).

AUG. 30 & 31. **Fern and Exotic Plant Show and Sale.** Los Angeles International Fern Society. Arboretum of Los Angeles County, Arcadia, California. (626) 335-4600.

## NORTHWEST

AK, ID, MT, OR, WA, WY

JULY 14–20. **The Complete Garden.** Classes in garden design, garden writing, practical gardening, and garden photography. Sponsored by Portland State University. Cannon Beach, Oregon. (503) 725-4186. [www.haystack.pdx.edu](http://www.haystack.pdx.edu).

JULY 27. **Spokane in Bloom.** Garden tour, festival, and plant sale. The Inland Empire Gardeners. Spokane, Washington. (509) 535-8434. [www.tiegardeners.org](http://www.tiegardeners.org).

AUG. 2 & 3. **60th Annual Flower Show.** Alaska Botanical Garden. Anchorage, Alaska. (907) 566-0539. E-mail: [norquist@alaska.net](mailto:norquist@alaska.net).

AUG. 23. **Bug Day.** Family-oriented educational activities related to insects. Sponsored by Albertson College and Idaho Botanical Garden. Idaho Botanical Garden. (208) 343-8649. [www.idahobotanicalgarden.org](http://www.idahobotanicalgarden.org).

## CANADA

JULY 26 & 27. **British Columbia Fuchsia & Begonia Society Annual Show and Competition.** VanDusen Botanical Garden. Vancouver, British Columbia. (604) 878-9274. [www.vandusengarden.org](http://www.vandusengarden.org).

JULY 27. **Herb and Flower Festival.** Devonian Botanical Garden. University of Alberta. Edmonton, Alberta. (780) 987-3054. [www.discoveredmonton.com/devonian](http://www.discoveredmonton.com/devonian).

AUG. 17. **Friends of the Garden.** Show, festival, and plant sale. Sponsored by Friends of the Garden. Langley, British Columbia. (604) 530-7304. <http://calendar.gardenweb.com/display/200308171000031242.html>.

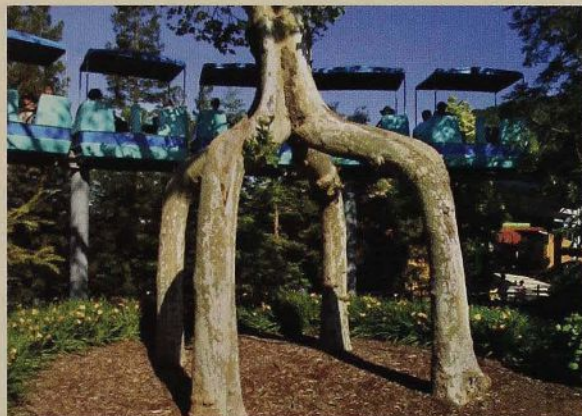
AUG. 22 & 23. **59th Annual Provincial Horticultural Show.** Indian Head Horticultural Society. AJM Davies Arena. Indian Head, Saskatchewan. (306) 695-2050.

## California Theme Park with a Garden Twist

ONE MAN'S LOVE of trees and horticulture is the motivation behind the success of Bonfante Gardens Family Theme Park in Gilroy, California. Michael Bonfante, former owner of Nob Hill supermarkets in California, sold the family business in 1998 to achieve his lifelong dream of building a theme park that would draw thrill-seekers and plant-lovers alike.

Bonfante Gardens' many attractions include roller coasters, a restored 1920s carousel, and a monorail that travels through the Monarch Garden greenhouse. With names like the Garlic Twirl and the Artichoke Dip, even the rides pay tribute to California agriculture. If the rides don't excite you, the park offers "garden-only" days where visitors can pay a discounted rate to view the plants that highlight the manicured grounds.

The park's most unique attractions—the Circus Trees—are the result of another man's arboricultural ardor. Starting in the 1920s, California farmer Axel Erlandson spent 40 years grafting trees into fanciful and whimsical shapes such as chairs, hearts, and bas-



One of the "Circus" trees at Bonfante Gardens in Gilroy.

kets. After Erlandson died in 1964, the trees were neglected for years. Bonfante purchased the surviving 29 trees in 1985 and moved them more than 50 miles to Gilroy, where 19 are now on display at Bonfante Gardens.

For more information, call (408) 840-7100, or visit [www.bonfantegardens.com](http://www.bonfantegardens.com).

## Cleveland Botanical Garden Expansion and Renovation Project

TRAVEL FROM THE arid deserts of Madagascar to the lush rainforests of Costa Rica all in one day when you visit the newly renovated Cleveland Botanical Garden, (CBG) which reopened to the public on July 15 after two years of construction.

The most stunning addition to the garden is the Eleanor Armstrong Smith Glasshouse, an 18,000-square-foot conservatory that houses living exhibits of two of the world's most fragile and exotic ecosystems—the spiny desert of Madagascar and the cloud forest of Costa Rica. "These contrasting environments illustrate the inter-relationships between living things," says Brian Holley, director of the Cleveland Botanical Garden and a member of the AHS Board of Directors. "Plants don't exist on their own, animals don't exist on their own."

More than 100 species of succulent plants are on display throughout the four exhibits that make up the Madagascan biome. The exhibit includes a 30-foot baobab tree inhabited by a tenrec, a relative of the hedgehog. About 85 percent of Madagascar's flowering plants, birds, and reptiles are found nowhere else in the world.

In the shady, tropical greenery of the Costa Rican biome, more than 300 succulent plant species thrive off one another in a lush cloud forest. A 40-foot strangler fig hosts three animal exhibits in its hollow trunk: an emerald swift lizard, a whip scorpion, and a tarantula. The tree also supports the Canopy Walk, which gives visitors a bird's-eye view of the cloud forest canopy and the river gorge 70 feet below.

Through partnerships with conservation agencies in Madagascar and Costa Rica, CBG is helping preserve the ecosystems in those countries.

For more information about CBG, visit [www.cb garden.org](http://www.cb garden.org), or call (216) 721-1600.

—Pia daSilva, Editorial Intern



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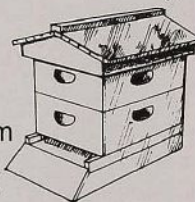
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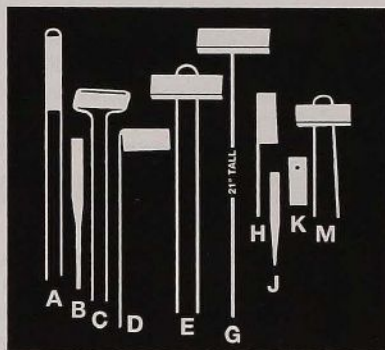
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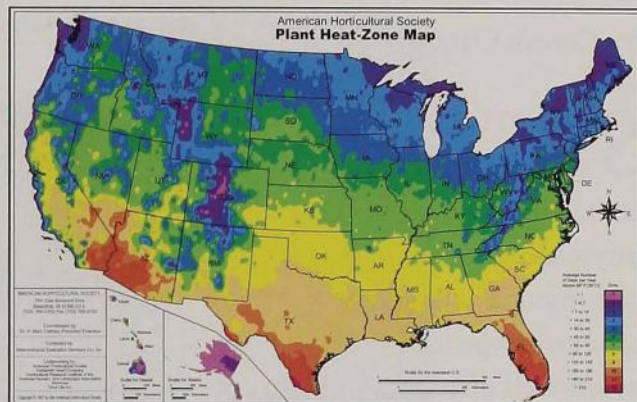
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## PRONUNCIATIONS AND PLANTING ZONES

Most of the cultivated plants described in this issue are listed here with their pronunciations, USDA Plant Hardiness Zones—based on the 2003 revised hardiness map—and AHS Plant Heat Zones. These zones suggest a range of locations where temperatures are appropriate—both in winter and summer—for growing each plant. While the zones are a good place to start in determining plant adaptability in your region, factors such as exposure, moisture, snow cover, and humidity also play an important role in plant survival. The zones tend to be conservative; plants may grow outside the ranges indicated. A USDA zone rating of 0–0 means that the plant is a true annual and completes its life cycle in a year or less. Many plants that are perennial in warm climates are grown as annuals in cooler zones. To purchase a two-by-three-foot glossy AHS Plant Heat Zone Map for \$9.95, call (800) 777-7931 or visit [www.ahs.org](http://www.ahs.org).



### A–C

- Acanthus spinosus*** uh-KAN-thus spih-NO-suss (USDA 5–9, AHS 9–5)  
***Adiantum capillus-veneris*** ad-dee-AN-tum KAP-ih-lus-ven-AIR-iss (8–11, 12–8)  
***Anchusa capensis*** an-CHEW-suh kuh-PEN-sis (7–9, 9–7)  
***Artemisia 'Canescens'*** ar-teh-MEEZ-yuh (4–8, 8–1)  
***Athyrium nipponicum 'Pictum'*** uh-THIH-ree-um nih-PON-ih-kum (5–8, 8–1)  
***Buchloe dactyloides*** boo-KLOH-ee dak-tih-LOY-deez (3–11, 12–2)  
***Clematis ×durandii*** KLEM-uh-tiss dur-RAN-dee-eye (4–9, 9–1)  
***C. recta*** C. REK-tuh (3–7, 7–1)  
***C. texensis*** C. teks-EN-siss (4–9, 9–1)  
***Consolida ambigua*** kon-SOL-ih-duh am-BIG-yoo-uh (7–9, 9–1)  
***Cyclamen coum*** SY-kloh-men KOOM (5–9, 9–5)  
***C. hederifolium*** C. hed-er-ih-FO-lee-um (7–9, 9–7)

### D–H

- Darlingtonia californica*** dar-ling-TONE-ee-uh kal-ih-FORN-ih-kuh (5–8, 8–5)  
***Dionaea muscipula*** dy-o-NEE-uh mus-KIP-yew-luh (12–15, 12–1)  
***Fritillaria imperialis 'Rubra Maxima'*** frit-ih-LAIR-ee-uh im-peer-ee-AL-iss (5–9, 9–4)  
***Galtonia candicans*** gal-TOH-nee-uh KAN-dih-kanz (7–10, 10–7)  
***G. princeps*** G. PRIN-seps (7–10, 10–7)  
***Gentiana andrewsii*** jen-she-AN-uh an-DREW-zee-eye (3–7, 8–1)  
***G. cruciata*** G. kroo-she-AY-tuh (3–7, 7–1)  
***G. dahurica*** G. duh-HOOR-ih-kuh (4–7, 7–1)

- G. gracilipes*** G. gruh-SIL-ih-pees (6–8, 8–6)  
***G. paradoxa*** G. pair-uh-DOK-suh (5–7, 7–5)  
***G. saponaria*** G. sap-on-AIR-ee-uh (4–7, 8–1)  
***Helichrysum italicum subsp. serotinum*** hel-ih-CRY-sum ih-TAL-ih-kum subsp. sair-OAT-ih-num (7–11, 12–1)  
***Helleborus ×hybridus*** hel-eh-BOR-us HY-bri-dus (6–9, 9–6)  
***H. niger*** H. NY-jur (4–9, 9–1)  
***Hydrangea aborescens*** hy-DRAN-juh ar-bor-ESS-enz (4–9, 9–1)  
***H. macrophylla*** H. mak-ro-FIL-luh (6–9, 9–3)  
***H. paniculata*** H. pan-ik-yew-LAY-tuh (3–8, 8–1)  
***H. petiolaris*** H. pet-ee-o-LAIR-iss (4–9, 9–1)  
***H. quercifolia*** H. kwer-sih-FO-lee-uh (5–9, 9–1)

### I–N

- Iris ensata*** EYE-riss en-SAH-tuh (3–9, 9–1)  
***I. pumila*** I. PYEW-mih-luh (4–9, 9–1)  
***Juglans cinerea 'Batesii'*** JEW-glanz sih-NEE-ree-uh (3–9, 9–1)  
***Lilium auratum*** LIL-ee-um awe-RAY-tum (3–8, 8–1)  
***L. regale*** L. ree-GAL-ee (3–8, 8–1)  
***Liriope muscari*** lih-RY-o-pee mus-KAR-eye (6–10, 12–1)  
***Magnolia acuminata*** mag-NOLE-yuh ak-yew-min-AY-tuh (4–8, 8–2)  
***Miscanthus sinensis*** miz-KAN-thus sy-NEN-siss (6–9, 9–1)  
***Muhlenbergia dumosa*** mew-len-BUR-jee-uh dew-MO-suh (11–12, 10–5)  
***Narcissus jonquilla*** nar-SIS-sus jon-KWIL-uh (3–9, 9–1)  
***N. tazetta 'Canaliculatus'*** N. tuh-ZET-uh (3–9, 9–1)

- N. ×odoros 'Rugulosus'*** N. o-DOR-us (3–9, 9–1)  
***Nasella tenuissima*** nah-SEL-luh ten-yew-ISS-ih-muh (7–11, 12–7)

### O–Z

- Oenothera brachycarpa*** ee-NOTH-ur-uh brak-ih-KAR-puh (4–8, 8–1)  
***O. odorata*** O.o-doh-RAY-tuh (4–8, 8–1)  
***Paeonia lactiflora 'Chocolate Soldier'*** pee-O-nee-uh lak-tih-FLOR-uh (3–8, 8–1)  
***Panax quinquefolius*** PAN-aks KWIN-kwe-FO-lee-us (3–9, 9–1)  
***Penstemon tenuis*** PEN-steh-mon TEN-yew-iss (3–8, 8–1)  
***Phlomis fruticosa*** FLO-mis froo-tih-KO-suh (8–9, 9–8)  
***Ptelea trifoliata*** TEE-lee-uh tri-fo-lee-AY-tuh (5–9, 9–5)  
***Quercus shumardii*** KWER-kus shoo-MAR-dee-eye (5–8, 8–1)  
***Salvia darcyi*** SAL-vee-uh DAR-see-eye (5–9, 9–5)  
***S. guaranitica*** S. gwar-uh-NIH-tih-kuh (7–10, 12–8)  
***S. madrensis*** S. mah-DREN-siss (6–9, 9–5)  
***Santolina pinnata subsp. neapolitana*** san-toh-LEE-nuh pin-NAY-tuh subsp. nee-uh-pol-ih-TAN-uh (9–11, 12–9)  
***Saponaria officinalis*** sap-on-AIR-ee-uh o-fiss-ih-NAL-iss (3–9, 9–1)  
***Sarracenia leucophylla*** sar-uh-SEE-nee-uh lew-ko-FIL-uh (5–9, 9–1)  
***Styloporum diphyllum*** sty-lo-FOR-um dye-FIL-lum (5–8, 8–1)  
***Viola odorata*** VY-o-luh o-doh-RAY-tuh (6–8, 8–6)



## Red-Hot Poker, Rocket Larkspur, and Alkanet

by Carole Ottesen

SCULPTURE ALWAYS draws the eye. In a garden, where it is manifestly other—inorganic, unyielding, manufactured—it can inject a jarring note into an otherwise peaceful scene. But when well chosen and thoughtfully situated, sculpture combined with plants creates high drama.

That's what happened at the Schlessman Plaza of the Denver Botanic Gardens. There, this combination of sculpture and a planting design by Lauren Springer join in a lyrically romantic tableau.

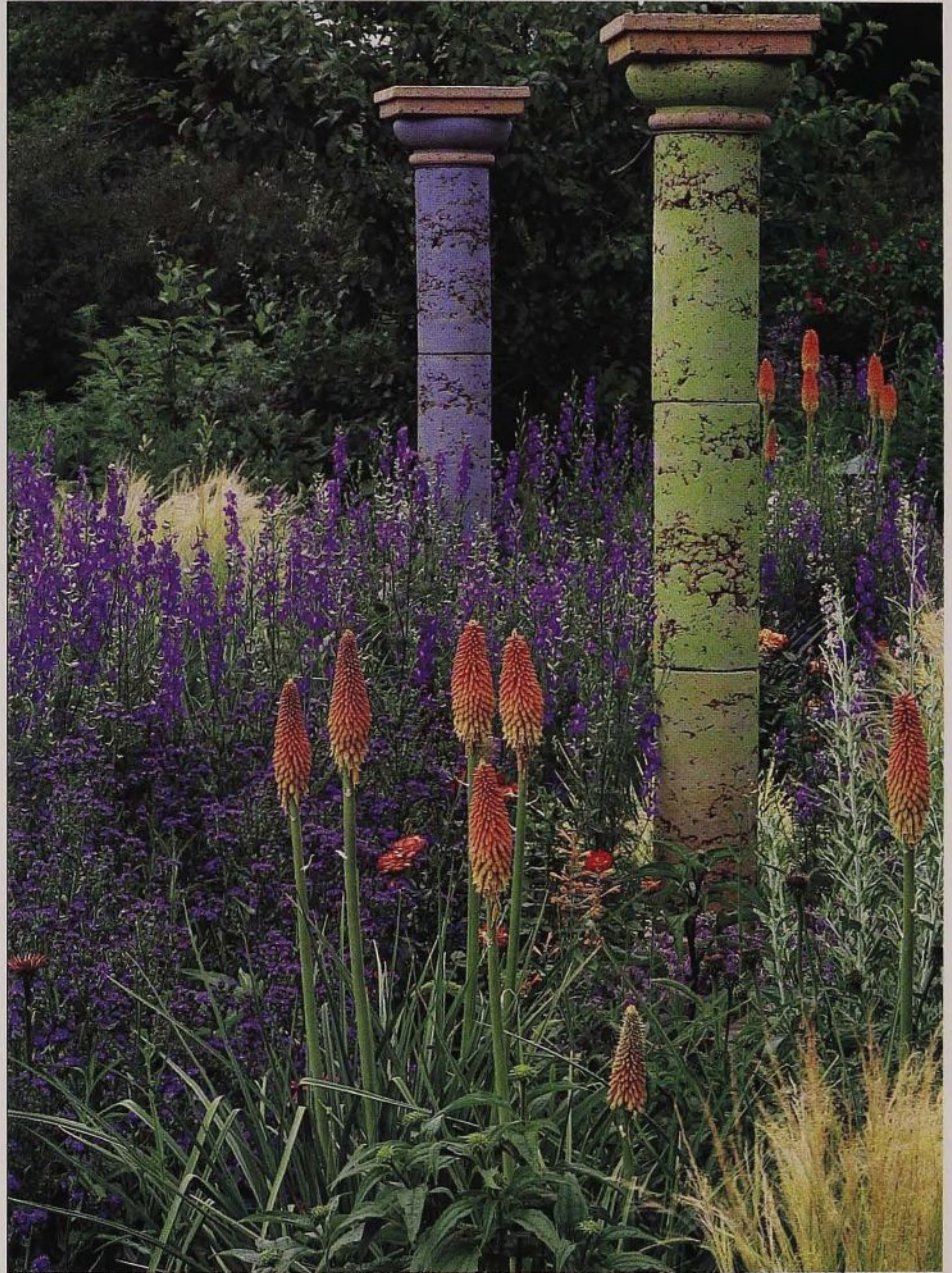
Red-hot poker plants (*Kniphofia* hybrids) and rocket larkspur (*Consolida ambigua*, sometimes listed as *C. orientalis*), plants with strong upright habits, repeat the verticals of the columns. But rather than compete with the columns, the individual upright habit of the rocket larkspur becomes a vertically patterned mass, subordinate to the whole. Shorter alkanet (*Anchusa capensis*) supplies a finished edge.

Big and bold, the columns, in a shorter, narrower field, would appear top-heavy above the flowers. As it is—in size, length, and breadth—the flowery field balances them and keeps the whole combination in perfect proportion.

The harmonious dialogue between sculpture and plants extends to the color scheme. One column, tinted purple, the other, green echo the purple-blue of the larkspurs and alkanets and the green foliage around them, while the terracotta of the capitals deepens in the red-hot pokers.

Great attention to detail—color, proportion, quantity—makes it all work. The difference between drama and disappointment depends on getting the combination right.

Carole Ottesen is an associate editor of *The American Gardener*.



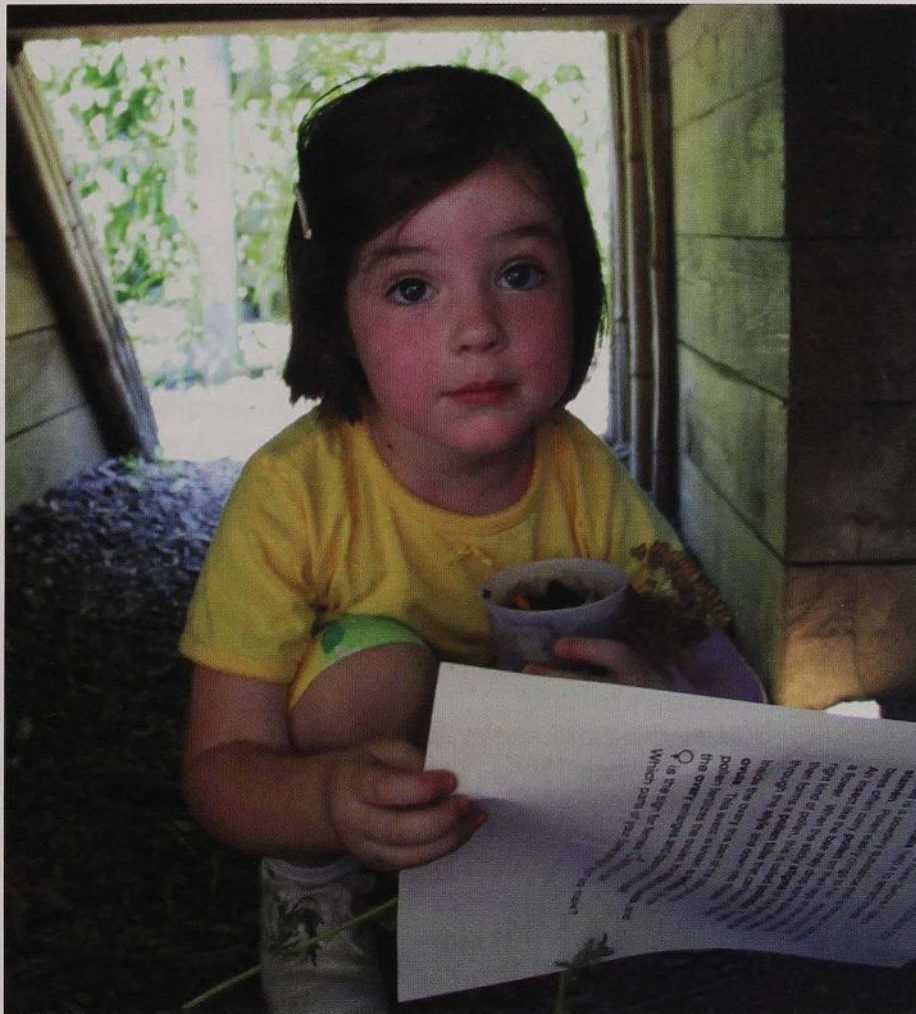
***Consolida ambigua*** (USDA Zone 7–9, AHS Zone 9–1). A two- to four-foot-tall cool-weather annual with white, lavender, purple, or blue flowers. Grow in full sun to part shade in well-drained soil.

***Kniphofia* hybrids** (Zones 6–9, 9–4). A perennial that has two- to four-foot-tall grasslike leaves and red, yellow, coral, or white flowers. Grow in full sun in well-drained soil.

***Anchusa capensis*** (Zones 7–9, 9–7). A six- to 14-inch-tall biennial with lavender, blue, pink, or white flowers. Grows best in full sun, well-drained soil, in cool summer areas.



# Sarah Doesn't Care that AHS has been Inspiring and Educating Gardeners for 80 Years.



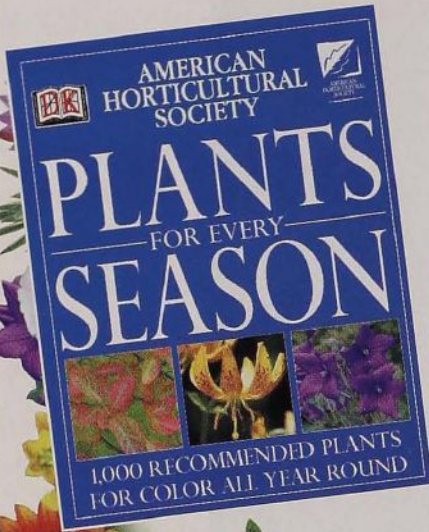
Sarah isn't all that interested in our 80th Anniversary celebration. Who can blame her? She just planted her first seed and found out that it will need water and sunshine to grow. She also learned that worms are very good for the soil—and a lot of fun to play with. **Sarah is one of many children whose introduction to the joys of gardening happened because of the caring people who have supported AHS for the past 80 years.** Living Lab programs at River Farm, like the one Sarah is involved in, are just a part of our larger mission to educate and inspire gardeners of all ages. We think that's pretty special and want to thank you on behalf of Sarah for being a part of that history. Take our word for it: Your support is very important to her.

She'd tell you herself, but she just spotted a butterfly on a nearby black-eyed Susan and is very busy watching it and wondering what it is doing. Thanks to you, she's about to find out.



If you'd like to make a donation to the American Horticultural Society, please contact Joe Lamoglia at (800) 777-7931 ext. 115, or visit our Web site at [www.ahs.org](http://www.ahs.org).

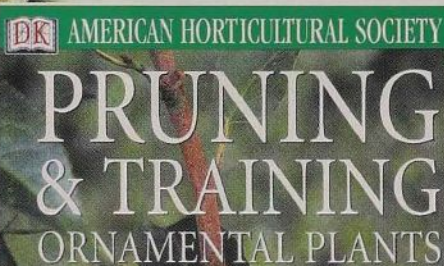
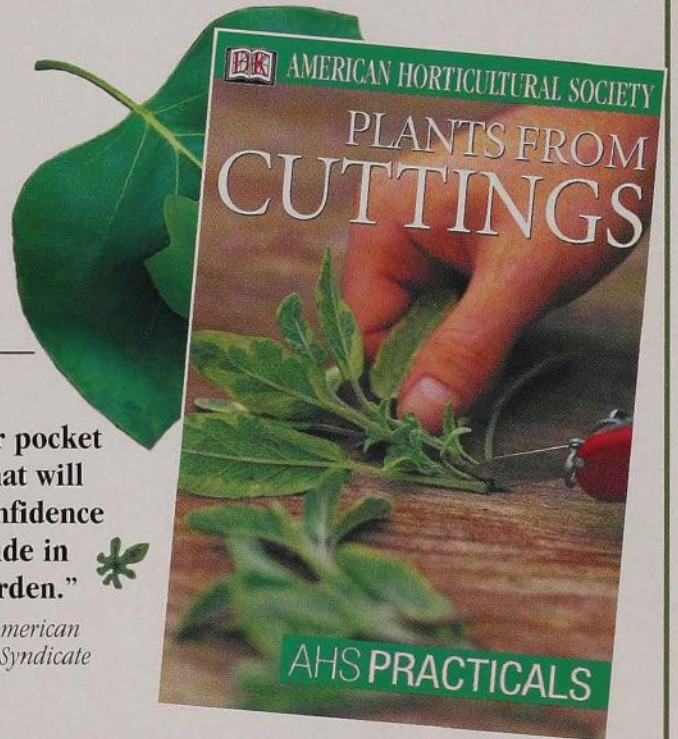




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