


The American GARDENER

The Magazine of the American Horticultural Society

September/October 2003



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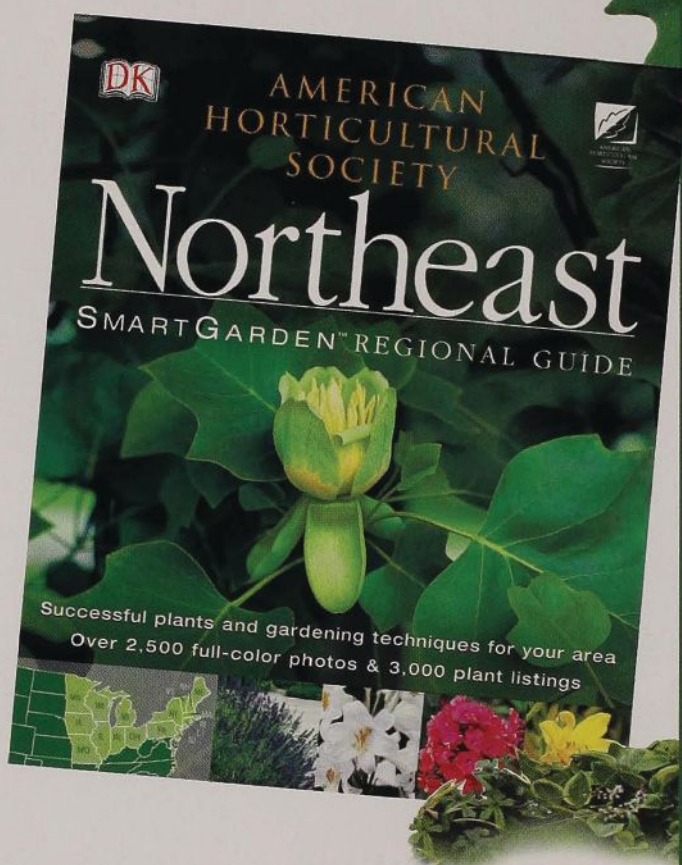
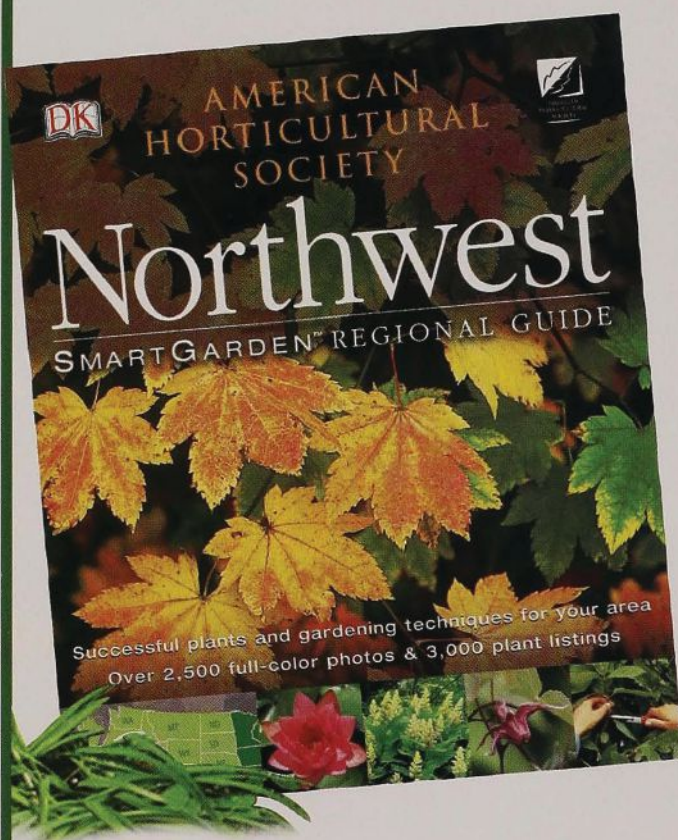
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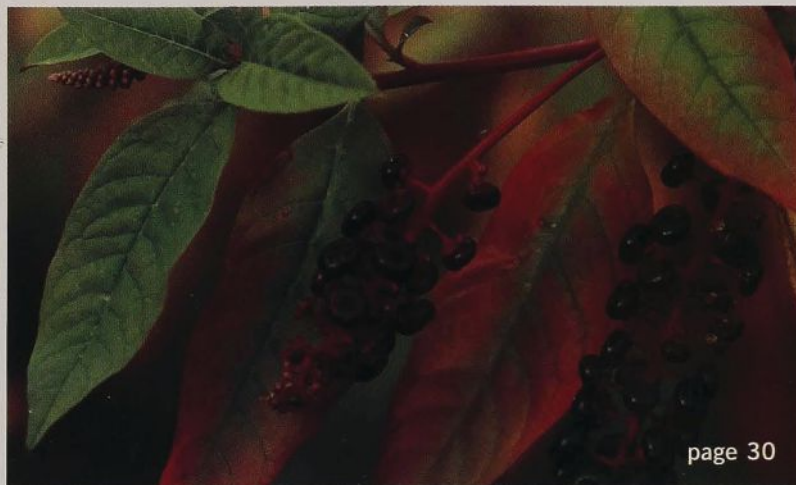
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To receive an application for the Society's Horticultural Intern Program, write to Trish Gibson at the address above or e-mail her at tgibson@ahs.org. Intern application forms can be downloaded from the River Farm area of the Society's Web site at www.ahs.org.

RECIPROCAL ADMISSIONS PROGRAM

The AHS Reciprocal Admissions Program offers members free and discounted admission to botanical gardens throughout North America. A list of participating gardens can be found in this year's *AHS Member Guide* and also in the Membership area of our Web site. For more information, call (800) 777-7931 ext. 127.

TRAVEL STUDY PROGRAM

AHS members and friends can visit spectacular private and public gardens around the world through the Society's exclusive arrangement with the Leonard Haertter Travel Company. For information about upcoming trips, call (800) 777-7931 ext. 117 or visit the Events section of our Web site.

WEB SITE: WWW.AHS.ORG

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

I AM SITTING IN my office here at George Washington's River Farm surrounded by drawings and images representing our vision for the future AHS National Center for Home Horticulture in America. And then I look out my window across the meadow blooming with wildflowers to the spectacular view of the Potomac River.

It's exciting, having this opportunity to envision a place where natural lands are valued, the historic heritage of the site is treasured, cultivated gardens are a showcase of great horticultural practices, and functional areas like roadways and parking lots demonstrate environmentally responsible design.

From our perspective, this property is already a national treasure that belongs to all Americans. And, at a time when green space near cities is fast disappearing, we feel that protecting this naturally beautiful landscape—as we have for the last 30 years—is of value to all of us.

But as we move forward with our Master Plan, we want to do more than just preserve this property. We are carefully and boldly envisioning a new River Farm that will have national significance. With innovative design, we can create demonstration gardens and educational displays that will become living showcases for the many programs and philosophies of the AHS. Once these model gardens are in place, we can share what we know and learn in *The American Gardener*, on our Web site, through our AHS gardening books, and in educational programs we sponsor throughout the country.

Our children's garden—with the sunflower maze in full bloom right now—is a small and effective way to demonstrate our strong belief that we must connect children with plants and gardens.



We have just completed installation of The Growing Connection Demonstration Garden, which contains EarthBoxes bursting with tomatoes, eggplants, peppers, and squash. Our Green Garage exhibit is filled with environmentally friendly tools and garden supplies provided by companies that share our commitment to responsible stewardship of the earth.

These programs are just a few of the ambitious plans we have for River Farm.

We are practical gardeners, anxious to share our enthusiasm and successes so that gardeners throughout America will catch the spirit and keep the momentum going.

I hope that you and other AHS members from all over America will soon find your way down the scenic George Washington Parkway (preferably by bicycle!) to discover first hand the magnificent home of your American Horticultural Society. In the meantime, we will keep you posted on our progress!

Happy Gardening!

Katy Moss Warner

—Katy Moss Warner, AHS President



MEMBERS' FORUM

WE NEVER SAID WE COULD SING

In her excellent piece, "Heuchera Explosion" (March/April), Carole Ottesen identifies the "white coral bells celebrated in song" as heuchera. In the musical round, "White Coral Bells," the flower named is lily-of-the-valley. It goes as follows:

*White coral bells upon a slender stalk,
Lily-of-the-valley, deck my garden walk.
Oh, don't you wish that you could
hear them ring.
That will happen only when the
fairies sing.*

Virginia C. Barker
East Orleans, Massachusetts

Carole Ottesen's response: Ever since we learned this round in girl scouts, I have been singing, "white coral bells upon a slender stalk, lala, lala, la, my garden walk." Thanks for filling in the forgotten words and reminding me that the song refers to lily-of-the-valley, not *Heuchera*.

YES TO THE GROWING CONNECTION

Thank you for your informative article, "Cultivating Food, Connecting Minds, and Harvesting Hope" (May/June). I am pleased to see the large role AHS is playing in The Growing Connection, a project designed to teach children around the world about the science behind growing food plants. I have been looking for a way to use my horticulture degree during these years that I am staying home to raise my three young children. Introducing this program to my community will be a great way for me to work with what I love most—children and plants! I'm ordering my kit today.

Mindy M. McQueen,
Kingwood, Texas

RAIN GARDENS BENEFIT ALL

I was very interested to read Maryalice Koehne's article on rain gardens in the March/April 2003 issue. It is encouraging to see that gardeners are helping to heal the environment through creative plantings that capture and clean runoff.

Lorraine Johnson
Toronto, Ontario

CARDINAL ERROR

In an article on vines for shade in the May/June issue, you identified the vine in a photograph on page 47 as cypress vine (*Ipomoea quamoclit*). However, I believe your photo shows cardinal climber (*Ipomoea xmultifida*). Cypress vine has much more finely cut leaves than the vine in your photo.

Debbie Goedde
Evansville, Indiana

Editor's response: We think you are correct, Debbie, although it's possible the plant could even be red morning glory (*I. coccinea*), which is the other parent—with cypress vine—of cardinal climber. The species cross freely and it is sometimes difficult to differentiate "pure" species from hybrids.

GARDENING AND RABBITS

I especially enjoyed the May/June issue because there were many timely articles to which I can relate personally.

I just have to offer congratulations to M.E. from Pennsylvania for the benign format to the rabbit question she asked in "Gardener's Information Service." My question would have read something like: "I can't master a rifle; is a pellet gun enough to drop a rabbit?"

I live in that peculiar, narrow USDA Zone 4 panhandle that runs down central New York. My house sits on a very wet hill of hard pan clay. In short, nature already hands me enough challenges.

The rabbits have moved into a snug burrow under our shed, excavated by a former resident woodchuck. To get the woodchuck to leave, I used one of those high-pitched, pulsating sound devices. It's no longer functional, and I swear the rabbits bit through the cord because it was severed with that distinctive angled cut rabbits use when they eat my clematis vines to the ground every year.

This past winter—when we had over four feet of snow—the rabbits destroyed or maimed a veritable wish list of plants. They girdled seven witch hazels, six flow-

ering quinces, three rose of Sharons, one contorted locust, and seven other newly planted trees and shrubs.

Last, worst, and the real root of my wrath, they girdled a one-foot section of trunk on my flowering hawthorn, which I grew from a root shoot of a \$350 birthday present that was killed by apple borers eight years ago.

Yes, I admit to growing lazy about fencing these past mild winters, but don't expect me to apologize for a bad attitude. I've almost stopped lamenting the loss of those two nasty hunting dogs that used to live nearby. Believe me, there were no rabbits, woodchucks, or squirrels around. Oh yeah, M.E., a big barking dog that likes living outdoors might be your answer.

As always, as spring brings old plants back to life, I find my joy for gardening renewed. I'm already looking for replacements for my losses.

Anita Sears
Otego, New York

INVASIVENESS A LOCAL ISSUE

I'd like to second my friend Pam Harper's comments in the March/April issue that decisions on invasiveness of plants need to be made locally. Some plants are invasive in one area and not in another. It's not a problem that can or should be decided on a national basis by some committee far removed from the problem.

Purple loosestrife is a good example. I grew it for years in Virginia Beach. It's one of the best plants to attract butterflies and bees. It's not invasive around saltwater areas, but certainly is a problem around fresh water. Nurseryman Andre Viette, speaking at the recent Mid-Atlantic Home & Garden Show, said the same thing.

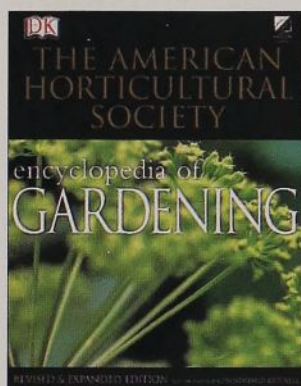
J. Robert Stiffler
Virginia Beach, Virginia

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Hot Off the Press

WHEN IT WAS FIRST published in 1993, the *AHS Encyclopedia of Gardening* quickly became an indispensable reference for every serious gardener. It is still highly sought after, even though it has been out of print for some years.

The good news is that the updated second edition of this classic, released by DK Publishing, Inc., in August, is even



bigger and better than the original. With updated nomenclature, the inclusion of USDA Hardiness and AHS Heat zones, and expanded sections on container gardening and fruits and vegetables, this book will become the mainstay of your gardening reference shelf.

Also just released by DK are the first two editions of the much anticipated AHS SMART GARDEN™ Regional Guide series, tailored to gardeners in the Northeast and Northwest. More information about these books and other upcoming new releases from AHS and DK Publishing will be forthcoming in *The American Gardener* and the AHS Web site (www.ahs.org).

New AHS Board Members Welcomed

FOUR NEW MEMBERS were elected to the American Horticultural Society's Board of Directors at the AHS Annual Meeting in April. "We are privileged to have these distinguished national leaders on our board," says AHS President **Katy Moss Warner**. "Each of them brings a strong commitment to connecting plants with people."

Natasha Hopkinson received her master's certificate in landscape design from Radcliffe College. She was the former urban and special garden host for National Public Radio's program, "The Cultivated Gardener," and worked as a segment host for The Home and Garden Television Net-



Natasha Hopkinson

work's program, "Breaking Ground." Natasha apprenticed for three years with landscape designer **Allen Haskell** before starting her own garden design firm in New York City. In addition to serving on the AHS Board, Natasha is hospitality chairman for the Garden Club of America.

Robert Malesardi earned his bachelor's of science degree from Bucknell University. Now retired, Robert once worked as a CPA in New York and New Jersey and as a real estate investor and developer. He was a trustee at Bucknell University and is now making important contributions as a member of the AHS development committee. He lives in Jupiter, Florida, and has a seasonal home in Easton, Maryland.

A resident of Annapolis, Maryland, **Donald Riddle Jr.** is a graduate of the University of Maryland's horticulture program and has been owner and president of Homestead Gardens, Inc. in Davidsonville, Maryland, since 1973. He is the former president of Garden Centers of America and the former director of Londontown Publik House and Gardens. He is currently the president of Excelling in Creative Gardening Concepts and serves on the America In Bloom executive committee.

Steven M. Still earned his doctorate in horticulture from the University of Illinois and is now a professor of landscape horticulture at Ohio State University. He is the executive director of the Perennial Plant Association, regional director of the Garden Writers Association, author of *Manual of Herbaceous Ornamental Plants*, and the recipient of medals from both AHS and the Massachusetts Horticultural Society. He lives in Hilliard, Ohio.

Master Gardeners

AHS WOULD LIKE to welcome the more than 1,000 Master Gardeners who have joined AHS as a result of the Society's participation in two Master Gardener conferences held this past summer.

AHS sponsored a booth at the 2003 International Master Gardener conference, which was held in the greater Cincinnati area in June. Four AHS representatives—AHS President **Katy Moss Warner**, AHS Board Chair **Kurt Bluemel**, AHS Board Member **Felder Rushing**, and Associate Editor **Carole Ottesen**—made presentations during the conference. Carole and Felder, who are also authors of many gardening books, participated in book signings after the presentations.

AHS was also a sponsor of the Michigan State Master Gardener Conference, held in East Lansing in June. As part of the arrangement with both conferences, all attendees are now AHS members.

Botanical Art on Display

THIS FALL AND WINTER, the display of a remarkable historic collection of botanical illustrations is expected to draw art aficionados and garden lovers alike to River Farm.

Titled "With Paintbrush and Shovel: The Watercolors of Bessie Niemeyer Marshall," the exhibit runs from October 27 to January 2, 2004, at AHS's headquarters building at River Farm and will feature about 60 illustrations. The exhibit is made possible by the Petersburg Garden Club (PGC), which owns the illustrations.

"The collection has relevance, whether you're an art fancier or a serious student of botany," says **Bettie Guthrie**, co-chairwoman of the PGC Herbarium Committee.

Marshall's watercolors date from the Depression era, when she was hired as an illustrator by the PGC to record the plant life in the newly formed Lee Park Wildflower and Bird Sanctuary in Petersburg, Virginia, which was established by the Works Progress Administration (WPA) in 1935. Marshall (1884-1960) produced 238 watercolors over the course of three years, documenting everything from the common cattail to a rare red milkweed.

"From the standpoint of accuracy and beauty, [her watercolors] are outstanding," says **Betty Steele**, co-chair of the PGC Herbarium Committee.

Despite such contemporary praise, Marshall's paintings went virtually unrecognized until the 2000 publication of *With Paintbrush and Shovel: Preserving Virginia's Wildflowers*, a book by **Nancy Kober** and botanical consultant **Donna Ware** that includes 222 reproductions of Marshall's original illustrations.

In Memoriam: Georgie Van de Kamp

A PASSIONATE gardener and philanthropist, **Georgie E. Van de Kamp**, whose dedication to AHS made her a leader and friend of the organization, died May 5 in California after a short illness. She was 96 years old.

"Many of us remember Georgie's unflagging energy and enthusiasm as she traveled with us and encouraged us to do great things for horticulture in America," AHS President **Katy Moss Warner** wrote to board members.

Georgie was a longtime member of the AHS President's Council and served as first vice president of the AHS Board of Directors from 1987 to 1990. She received the AHS Meritorious Service Award in 1988 and co-founded the AHS Advisory Council with former board member John Whitworth.

"She really wanted to inspire people to become more involved in horticulture," remembers **Bob Volk**, a member of the AHS Board of Directors and friend of Georgie's.

She played an integral part in creating **Lawry's California Center** gardens, and her many contributions to **Descanso Gardens** in La Cañada, California, led to the creation of an exhibition hall at the gardens named in her honor.

Georgie lived in Padasena, California, for most of her life and committed herself to horticulture in California, developing a strong interest in the wildflowers of her home state.

She will be remembered by many in the field of horticulture for her friendship and support.

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Seeds Launched into Space to Initiate "The Growing Connection"

DOES SPACE travel affect seed germination? Will seeds bombarded by cosmic rays develop into normal plants? How does solar radiation affect how tomatoes grow? These are a few of the questions that participants in the initial phase of The Growing Connection will try to answer.

SPACE SEEDS

As this issue goes to print, a payload of seeds is about to take a ride in a huge, helium-filled space balloon. Carried to an altitude of approximately 120,000 feet above 99 percent of the Earth's atmosphere on a National Aeronautics and Space Administration (NASA) balloon, the seeds will experience temperatures of approximately minus 40 degrees Fahrenheit and reduced atmospheric pressure, along with a variety of other conditions they would never encounter on Earth.

"They will be exposed to everything that comes in from space," says NASA mechanical engineer **Henry Cathey**—who happens to be the son of AHS president emeritus **Dr. H. Marc Cathey**. The younger Cathey explains that the sun's "radiation is reduced by the atmosphere, limiting cosmic rays, X-rays, and a number of other things from reaching Earth."

"We are extremely fortunate to have this chance to send seeds up so that kids



Seeds for The Growing Connection will be carried into space as the "payload" (shown above, hanging from a crane) for a giant NASA science balloon like the partially inflated one you can see above. Once in space, the balloon will inflate to roughly the size of the Houston Astrodome.

can not only hypothesize about the chance for abnormalities or mutations, but to conduct experiments to test their theories," says **Mary Ann Patterson**, AHS director of national programs.

Ball Horticultural Company, headquartered in West Chicago, Illinois, collected the seeds for the project from several different companies. The seeds include tomatoes, eggplants, lettuces, peppers, and five varieties of sunflowers.

"This program is particularly compelling to us, because it combines two of our main goals at Ball: fostering education and creating excitement in the world of

horticulture," says **Sue Amatangelo**, national retail accounts manager for Ball.

After returning to Earth, the space traveling seeds, along with packages of "control" seeds will be included in complete growing kits distributed to participating schools and youth groups. To find out how to order The Growing Connection Kit, see the box below.

THE MAIN MISSION

The initial experiments with the space seeds are an exciting and educational introduction to The Growing Connection, which was developed by AHS, the **Food and Agriculture Organization of the United Nations (FAO)**, and several other partners.

Next year, when the formal component of the program debuts, 10 schools in the United States and 10 schools in the West African nation Ghana will be linked to investigate the science behind growing food plants and learn important lessons about nutrition and sustainability.

Through state-of-the-art information technology, exchanges will be possible among students, teachers, and scientists participating in the program.

Participate in The Growing Connection

To get involved with the exciting space seed experiments—and at the same time, support the broader goals of The Growing Connection—order one or more The Growing Connection Kits. In addition to 26 packages of seeds (some launched into space aboard the NASA balloon), each kit includes a self-contained growing unit called an Earth Box™, one bag of soilless mix, fertilizer and dolomite, and activity guides describing how to conduct experiments on the plants—everything you need to get your children or youth group started growing and learning.

For each kit you purchase for \$59.95 plus \$15 shipping, one-third of your purchase price will be credited toward donation of an additional kit for the program. To order, visit the AHS Web site at www.ahs.org or call AHS at (800) 777-7931.

Future of Children's Gardening Addressed at 2003 Symposium

by Maureen Hartshorn

SOME SPECTACULAR ideas sprouted in Northern Virginia from July 24 to 26 during the 11th annual National Children and Youth Garden Symposium. More than 200 youth garden experts from various disciplines came together to share ideas and brainstorm the future of children's gardens and gardening. One common theme emerged from the three-day gathering: To achieve the AHS vision of "making America

a nation of gardeners, a land of gardens," children must be the starting point.

"This was such a profound experience for the people who came from all over the country," said Mary Ann Patterson, AHS director of national programs and public relations. "It showed us how far we have come, it stretched our ideas of what we can accomplish, and it forged relationships through which we can make it happen."

There were far more workshops and opportunities to see model children's gardening programs in action during the three-day symposium than can be covered in this space. For additional information, visit the AHS Web site (www.ahs.org).

GROWING THE FUTURE

Norm Lownds, associate professor of horticulture at Michigan State University, moderated the Growing the Future workshop, in which participants reviewed the history of children's gardening, pinpointed successful existing programs, and used interactive sessions to generate excitement about the future of youth gardens.

By the end of the workshop, the group had identified several goals, including teaching kids to be trustees of the earth, improving teacher education and certification requirements, establishing gardens and outdoor classrooms at all schools, and supporting research that evaluates the positive effects of gardening in character development and student test scores.

"Because we identified some of the first steps we need to take and outlined a plan for the future," said Lownds, "we can come back a year from now and see what progress we've made."



A model of the Parthenon at the outdoor classroom area at Tuckahoe Elementary School.

CHILDREN'S GARDEN DESIGN WORKSHOP

The Children's Garden Design workshop, held at Green Spring Gardens in Alexandria, was hosted by the garden's designer and horticulturist, Cindy Brown, along with Charlotte Albers, children's education coordinator.

"The staff's knowledge of plants and how they could be used to reach out to children was amazing," said workshop attendee Laurie DeMarco, a horticulture and education consultant.

Participants enjoyed seeing many simple and inexpensive ideas for engaging kids' imagination at Green Spring's Family Garden, ranging from a quiet tea-party nook to a bathtub full of plants, complete with a working shower.

DISCOVERY SCHOOLYARD

Symposium attendees were also im-

pressed and inspired by the Discovery Schoolyard workshop held at Tuckahoe Elementary School, a public school in Arlington County that incorporates outdoor and academic learning into the curriculum for all grade levels.

During two scheduled tours, visitors had a chance to tour Tuckahoe's seven outdoor garden classrooms. Among these is a pond habitat designed to simulate the ecology of the Chesapeake Bay watershed and a small-scale Parthenon that brings history to life in the Ancient Plaza classroom.

"I am involved in a consortium of organizations working to identify the elements that should be part of a model school garden program," said Lynne Cherry, a naturalist and children's book author. "But here was Tuckahoe, which is the prototype—they are integrating all aspects of the curriculum in their outdoor classrooms

and doing everything we would hope to have in a model program."

AWARDS AND KEYNOTE ADDRESS

At a banquet on Friday, the 2003 AHS Jane L. Taylor Award for excellence in youth gardening was presented to Delaine Eastin, former state superintendent of public instruction in California, for her initiative to institute a garden in every public school in her state.

Jane L. Taylor, for whom the AHS award is named, presented the symposium's keynote address.

Children's gardens, said Taylor, should be fun, educational, accessible, and interactive. The objective, she added, should be to get kids interested in real plants. "Don't water down what you're doing in the garden," Taylor said. "Plants are the focus."

Taylor inspired everyone in attendance to strive for future improvements in youth gardens. "The lessons and the seeds you are planting now will come back in the future," Taylor said.

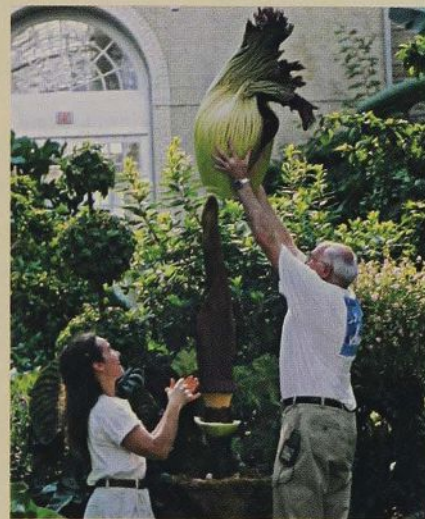
Maureen Hartshorn is editorial intern for The American Gardener.

A Rare Treat for Symposium Attendees

About 25 symposium participants had a once-in-a-lifetime opportunity on June 25 to see Smithsonian botanist Dan Nicolson dissect the flower of the rare titan arum (*Amorphophallus titanum*), also known as "corpse flower," which had just bloomed at the U.S. Botanical Garden (USBG). (See related story on page 16).

Christine Flanagan, USBG manager of public programs, invited the AHS group to join Smithsonian and USBG employees in a viewing of Nicolson's machete-assisted "autopsy" of the plant, which had, fortunately, lost its trademark stench by that time.

"We all felt like plant nerds, but we didn't dare miss it," said YGS attendee David Pippin, president of Creations & Ideas, Inc. Because the display had just closed to the public at the time the dissection took place, Pippin said hundreds of people were gathered outside, faces against the glass, hoping to catch a glimpse of Nicolson's surgery. "It was exciting to see that one plant could create so much interest," he said. —M.H.



Botanist Dan Nicolson lifts off the spathe of the titan arum as Deborah Bell, museum specialist at the Smithsonian, watches.

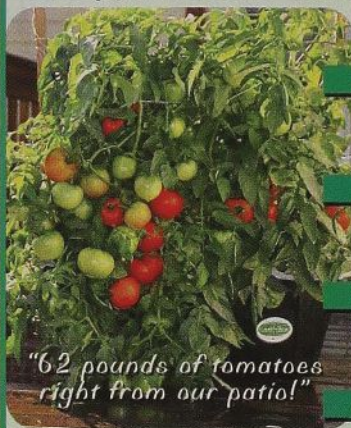
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FALL CARE FOR CALLA LILIES

My calla lilies are blooming beautifully right now, and I'd like to grow them again next year. As fall approaches, how do I go about dividing the bulbs and storing them over winter? I live in USDA Hardiness Zone 5.

—T.L., MADISON, WISCONSIN

Calla lilies (*Zantedeschia* spp.) are native to southern Africa, and although species vary in their hardiness, none are reliably hardy in Zone 5. If you are growing them in containers, you can bring the containers indoors before frost, place them where they will receive bright, indirect light, and grow them on as houseplants.

If your calla lilies are growing in the ground, dig them in fall as soon as the foliage begins to turn yellow or brown. Loosen the fleshy rhizomes gently, and if you are interested in propagating them, separate side shoots at this time.

Minnesota Extension horticulturist Mary H. Meyer, advises that the rhizomes should be cured for one to three days in a well ventilated room, away from direct sunlight or drying winds, before storing them for the winter in sphagnum peat or vermiculite, in a cool, dry room.

AILING TOMATOES

My tomato plants are very green and healthy and producing lots of young, green tomatoes. The leaves, however, are curling up. Should I be concerned?

—G.C., VIA E-MAIL

Tomatoes like relatively constant moisture and do not tolerate excesses in wetness or dryness. Large swings between wetness and dryness can result in a number of problems, some more serious than others. Sounds like you have leaf roll, a condition common with tomatoes. It is a temporary disorder that results from excessively wet soil and is especially noticeable after heavy rains. Fortunately, it

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does not slow the plant's growth and a normal crop of fruit is usually produced. As the soil dries, the symptoms disappear and the plants return to normal.

NON-BLOOMING HYDRANGEAS

I live in central Wisconsin and there are three hydrangeas on my property that are about five years old and have never bloomed. The plants are about two feet tall and have dark green, two-inch-by-four-inch leaves with serrated edges. Two of them are in the shade most of the time and the other gets about a half day of sun. Why haven't these plants bloomed?

—B.O., VIA E-MAIL

It sounds like they are probably big leaf hydrangeas (*Hydrangea macrophylla*). They are considered hardy only to USDA Zone 6, while central Wisconsin is probably Zone 4. Although these hydrangeas will survive in colder areas, they will not thrive and will not flower reliably.

In an article about hydrangeas in the July/August 2003 issue of *The American Gardener*, author Richard Bir suggested that lack of bloom is generally caused by one or more excesses: sun or shade, nitrogen fertilizer, cold, etc. "More often, however, the cause is improper pruning by the gardener or a cruel trick of Mother Nature," wrote Bir. Hydrangea flower buds develop in summer, the year before the flowers appear, so "anything that damages flower buds will result in a lack of flowers."

In your case, the "excess" that is responsible for the lack of blooms is most likely cold temperatures. An inelegant way

to protect the buds is to wrap the plants in burlap in late fall. (See "Seasonal Garden Goods" on page 54 for other protection options.)

You could also consider replacing your hydrangeas with some of the reliable rebloomers Bir recommended in his article, including 'David Ramsey', Endless Summer™, or 'Oak Hill'.


COMBATING HORSETAILS

I have horsetails growing in my yard and would like to know how to get rid of them.

—L.W., VIA E-MAIL

Horsetails (*Equisetum* spp.) are primitive plants that have existed unchanged for eons. They can be very invasive and hard to eliminate, especially in moist soil. These flowerless, seedless plants thrive in moist areas, and reproduce by spores and—more problematically—underground rhizomes that can extend more than three feet below ground.

Andy Kendig, extension weed specialist at the University of Missouri, says the university has just begun a study on the control of equisetum. "The first thing we've found out is that the stuff is hard to control—even very high rates of Roundup did little," he says. "Our best treatment so far has been herbicides related to the 'Weed-B-Gon/Dandelion Killer/Trimec' herbicides. These products must be used with great caution around desirable broadleaf plants."

As an active, backyard gardener, however, Kendig continues, "I say with 'great authority' that you cannot replace manual or mechanical weed control." So if the horsetails haven't spread over too great an area, a diligent digging program is probably your best bet. 

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

A Call from the Wild

by Monica D. Grabowska

WHEN WE bought our first home near a small town at the edge of the Blue Ridge Mountains, I was anxious to become a gardener. The rocky woodland that dominates our backyard was overflowing with weeds. I had grand visions of whacking them back and shaping my own garden paradise. There would be planters and borders filled with flowers and a large raised bed outside the kitchen door for a formal herb garden.

Fortunately, the size of the yard overwhelmed me, and parenthood soon sidetracked me. Thus our yard was saved from the destructive improvements I had envisioned.

That untamed place at the back of our half-acre lot has become my favorite part of the yard, a refuge for me and a host of wildlife. From the kitchen window, I see chipmunks and squirrels scurrying over the rocks, woodpeckers and wild turkeys swooping into the trees, and our resident ground hog lumbering onto the lawn.

Each year I find a new treasure growing among the weeds and rocky outcrops. Each one has changed the way I look at our lot and the way I garden.

The first year, in early spring, something white on the ground caught my eye from the kitchen window. Litter? I headed out to investigate. Small crocuslike flowers had pushed up through the cover of brown fallen leaves. I picked one and was startled by the bright crimson liquid that dripped from the torn stem. Grabbing my wildflower field guide, I soon found its identity—bloodroot (*Sanguinaria canadensis*)—and learned it was used by eastern woodland Indians to make a dye for baskets, clothing, and face paint. It was also used as an insect repellent.

The moment was an epiphany. Suddenly the surveyor's lines disappeared from the yard and I saw it as part of a much bigger landscape, one that stretches over both space and time, connecting me to people who walked here hundreds of years ago and to everyone who has passed through since. And, at the same time, I felt as if I were the first person to discover this little white flower with its scarlet secret.

I soon made other such discoveries, precious remnants of our neighborhood's past. Jack-in-the-pulpit (*Arisaema triphyllum*) was harvested by Indians as a root vegetable. A charming and unique plant, it invites an intimate inspection in the spring—how else to glimpse “jack” hiding in the “pulpit?” Cut-leaved toothwort (*Dentaria laciniata*) is an early spring flower that evokes a world of fairies with its delicate cluster of nodding white flowers. Blooming at the same time is another plant from the fairy realm, the mayapple (*Podophyllum peltatum*). Its large umbrellalike leaves cover an apple-blossom flower that is only

visible to whatever tiny creature might take cover under a canopy only a foot high.

I go looking for such gems in our woods in the fall, winter, and spring. In summer, the way is blocked by a wall of brambles and other clinging weeds. But one June I was called into the woods by another intriguing native flower. There is nothing diminutive about *Cimicifuga racemosa*, otherwise I would never have noticed it. The white five-foot candlelike flower spikes waved to me above waist-high weeds and seemed to light my way into the woods.

Like so many wildflowers, *Cimicifuga racemosa* goes by several common names. Where I live, it is usually called bugbane. Its root was once used to treat a variety of ailments and was also believed to chase away bedbugs—hence the common name.

The lively common nomenclature alone of many of our indigenous species could have convinced me to take up native plant gardening. Dr. Seuss could not have done better than these:

Thorny pigweed, sharp-winged monkey flower, nodding onion, pussytoes, lizard's tail, turkey beard, bishop's cap, monkshood, Barbara's buttons, Dutchman's breeches.


And what gothic villain could possibly compete with the likes of bastard toadflax?

These wild characters have ambushed my garden dreams. Where I had once planned for astilbes, hostas, and lilies of the valley, I have planted Christmas ferns, foam flowers, and trout lilies. And where I pictured order and design, I am now happy to go with Nature's serendipitous chaos.

I suppose someday I will plant that formal herb garden. In fact, every year I get a start on it, but to the delight of my daughters and the place in my heart where my own childhood still lingers, I am easily pulled away from it and into our woodland sanctuary. We follow a narrow, overgrown path into a land long ago where Indians gather food and medicine from an unending forest. And sometimes that path leads us to a mysterious world where flowers bleed, fairies hide, and the bedbugs never bite.

Monica D. Grabowska is a free-lance writer who lives and gardens in Shepherdstown, West Virginia.





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Horticultural News and Research Important to American Gardeners

Super-hardy Finnish Rhododendrons

Nine new extraordinarily hardy rhododendron cultivars, developed through a Finnish breeding program, are turning up in American and Canadian nurseries. Their development can be traced back to 1935, when a batch of rhododendron seeds arrived at Finland's Mustila Arboretum, located east of Helsinki. The seeds, originally collected in the mountain ranges of Korea and Japan, produced plants that for many years could not be classified. In 1970, they were identified as *R. brachycarpum* and given the subspecies name *tigerstedtii* to honor amateur plant breeder C.G. Tigerstedt, who introduced them.

Having withstood 49 degrees below zero Fahrenheit at the Mustila Arboretum, *R. brachycarpum* subsp. *tigerstedtii* is considered the most cold-hardy of all known rhododendrons. It became the mainstay of a breeding program begun at Helsinki University in 1973 under C.G. Tigerstedt's son, Peter, who is now professor emeritus at the university. This eight- to 10-foot, pink-flowered species may or may not hand down its height or flower color to its hybrid progeny, but usually manages to bequeath extreme hardiness.

Peter Tigerstedt started his evaluation program with hybrid

seedlings of *R. brachycarpum* subsp. *tigerstedtii* and its crosses with other species including *R. smirnowii*, *R. metternichii*, and some forms of the American native *R. catawbiense*.

In collaboration with the Helsinki Parks Division, 22,000 of Tigerstedt's hybrids were planted out in various sites. Then

the harsh Finnish winter did the work of selecting for hardiness, culling from thousands to just 80 that were propagated clonally. Of these, nine immensely cold-hardy survivors have been introduced so far. "Generally my cultivars are hardy in [USDA] Zones 3 and 4," says Tigerstedt. "They are doing quite well at the Minnesota Landscape Arboretum in Chanhassen, Minnesota."

The nine cultivars are red-flowered 'Elvira'; pink-flowered 'Haaga', 'Helsinki University', 'Kullervo', 'Pekka', and 'Pohjola's Daughter'; deep rose 'Hellikki', and white 'St. Michel'—the hardiest of the cultivars, and 'P.M.A. Tigerstedt' (sometimes



Finnish hybrid rhododendrons in a Helsinki park.

listed as 'Peter Tigerstedt').

One American mail-order source for these new cultivars is Rice Creek Gardens, 11506 Highway 65, Blaine, MN 55434. (763) 754-8090. www.ricecreekgardens.com. Catalog available online only.

A TREE GROWS (BETTER!) IN BROOKLYN

Researchers studying differences in growth habits between trees growing in urban and rural areas got a surprise when the trees in urban areas grew larger than their rural counterparts.

This finding, published in the July 10 issue of *Nature*, countered the researchers' expectation that city-grown trees would fare less well than those planted in rural areas. In the city, they hypothesized, trees would struggle in air thick with particulate and photochemical pollutants while grow-

ing in soils laden with heavy metals.

The team of researchers from Cornell University and the Institute of Ecosystem Studies in Millbrook, New York, planted cloned cottonwood trees (*Populus deltoides*) in and around New York City as well as in rural areas of the Hudson River valley and Long Island, about 50 miles from the city center. The ones in the city thrived, growing double the size of the rural trees.

Because urban areas experience so many variables, "it was difficult to tease

apart the influence of the multiple different factors" that might account for the difference, says Jillian W. Gregg, a Cornell University ecologist and lead author of the study. In the end, the researchers were able to eliminate variables such as soils, temperature, light, carbon dioxide, nutrient deposition, and microclimates. "Instead, we found that higher cumulative ozone exposures accounted for the reduced growth at the rural sites," Gregg says.

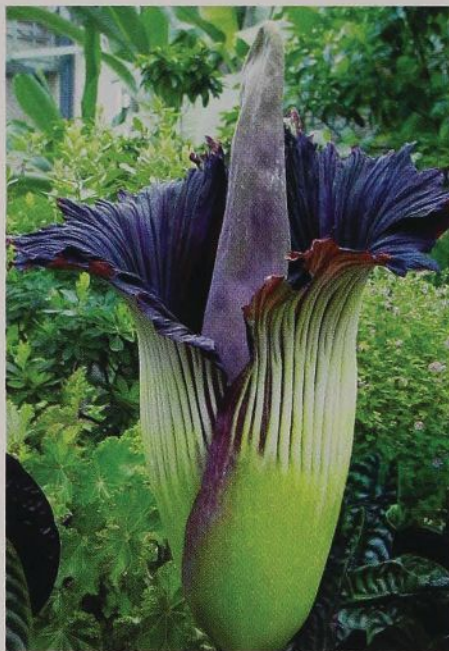
Ozone—a pollutant formed by a chemical reaction between oxygen and sun-

light—is tougher on trees in rural areas, Gregg explains, because in urban areas other air pollutants, such as nitric-oxide, quickly break down ozone into benign constituents. “So in most rural areas, where nitric oxide concentrations are low,” says Gregg, “ozone that has migrated from urban areas remains in the air longer.”

Lest anyone jump to the conclusion that polluted city air is good for plants, the researchers caution that the study explored only the short-term effects of pollutants on the growth of trees. Longer-term studies would be required to give a complete picture of how pollutants affect plants.

THE STENCH OF SUCCESS

When the titan arum (*Amorphophallus titanum*) began blooming at the United States Botanic Garden in Washington, D.C., on the morning of July 23, lines of those waiting to view the behemoth flower snaked around the conservatory building. Inside, five-deep rows of people encircled the regal rain forest flower, fascinated by its amazing size—almost five feet tall—and otherworldly appearance. They posed for



This titan arum bloomed at the U.S. Botanic Garden in July and drew crowds of visitors.

photos with it and inhaled the fetid stench emitted from its spadix.

The plant's odor of rotting flesh evolved to attract carrion beetle and flesh

fly pollinators and is the inspiration for one of this plant's common names, “corpse flower.” Its botanical name describes the flower's anatomy: *Amorpho*-meaning “shapeless,” and *phallus*, “penis,” refer to the enormous, upright spadix, revealed when the pleated, blood-colored spathe unfolds; the specific epithet, *titanum*, of course refers to its gigantic proportions.

From the beginning, the titan arum has excited curiosity. In 1898, a plant raised from seed collected in Sumatra by Italian botanist Odoardo Beccari bloomed at England's Royal Botanic Garden at Kew, igniting the Victorian passion for exotic plants. When the plant bloomed again in 1926, police were needed to control the crowds.

The first titan arum to bloom in the United States was in 1937 at the New York Botanical Garden. It achieved instant fame, drawing enormous crowds, and earning the title of the official flower of the Bronx. Since that time, fewer than 20 flowerings have occurred in the United States, but each became an event unto itself.



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The largest flower measured six feet eight inches at the University of Wisconsin—Madison in June, 2001; two simultaneous blooms appeared at the Marie Selby Botanical Gardens in Sarasota, Florida in May, 1999; a titan arum tuber at the Fairchild Tropical Garden in Coral Gables, Florida weighed in at 68 pounds.

CLUMPING BAMBOOS

Have you always admired bamboo, but were afraid of runaway shoots and neighbor's lawsuits? *Fargesias* have all of bamboo's delightful attributes—Graceful form and delicate, elegant foliage—but none of its scary potential. *Fargesia's* runners will



Tall-growing *Fargesia robusta* offers the look of bamboo but is better behaved.

never poke up through your neighbor's asphalt driveway. Like many of the tropical *Bambusa* spp., they are clumping, but unlike *Bambusa* spp., they are hardy, frost-proof, and suitable for many parts of the United States. Fountain bamboo, *Fargesia nitida* (USDA Zones 5–9, AHS Zones 9–5), grows into a dense, six-foot clump with mahogany-colored culms; umbrella bamboo (*F. murielae*, Zones 5–9, 9–4), has six-foot arching green culms; *F. robusta* (Zones 6–9, 10–5) is heat-tolerant and grows to 20 feet.

THE OLDEST LIVING MOTHER

Methuselah, the oldest known tree, a 4,733-year-old bristlecone pine (*Pinus longaeva*), has recently produced a dozen

healthy saplings from seeds taken from one of her pine cones.

One sapling will be presented to the U.S. Botanic Garden, where, says Director Holly Shimizu, “we’ll keep it in our production greenhouses, where we can control the environment. Ultimately, we will probably plant it in the oasis section of the new conservatory. It’s a cool desert oasis, an environment where it will be happy. It actually has air conditioning. In Washington, D.C., this is the only place where it will have a chance of survival.”

The oldest bristlecone pines are found in the dry, cold, wind-swept high elevations of 10,000 feet or more, such as California’s White Mountains near Death Valley, where there is only a thin layer of topsoil. The bristlecone also grows in Colorado, Nevada, and New Mexico.

Many ancient trees exhibit large areas of die back (deadwood) and only the thinnest strips of living bark, which may hold a secret to their longevity. With a minimum of bark and canopy, these trees reproduce and cling to life as they have done for countless centuries. Ironically, their greatest threat is not drought, wind,

or cold, but tourists. For this reason, Methuselah’s exact location is kept secret.


GRAHAM STUART THOMAS DIES

Horticultural artist, author, and garden designer extraordinaire Graham Stuart Thomas died on April 17, 2003, aged 94.

Born in 1909 in Cambridge, England, he studied at the University Botanic Garden at Cambridge before taking positions with several different nurseries.


Over a lifetime of gardening, he acquired a vast knowledge of plants that was distilled in his many books, including *Old Shrub Roses* (1955), *Perennial Garden Plants* (1975), and his most recent, published this past April, *The Garden Through The Year*.

For his work supervising the restoration of National Trust Gardens, Thomas was awarded the Order of the British Empire in 1975; His many other honors include the Veitch Memorial Medal (1966); the Victoria Medal of Honor (1968); a vice-presidency of the Royal Horticultural Society; and the Royal National Rose Society’s Dean Hole Memorial Medal (1976).



Dear Sirs,
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Ernie & Edna West
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Fields of Dreams

Many former AHS interns go on to enjoy diverse careers in horticulture. Here's a look at what some of them are doing now.

BY PIA DA SILVA

For more than 20 years, the internship program at AHS has been going strong, thanks to the generous support of many dedicated AHS members. Over that time, it has grown from what amounted to a summer job to a year-round program where budding horticulturists can learn about plants and expand their career horizons.

Now, anywhere from one to three interns are at work each season at AHS's River Farm headquarters, doing everything from replanting flowerbeds to practicing integrated pest management and working on landscape design drawings for the Master Plan. Interns also have the opportunity to get involved with AHS's many programs, including the annual Seed Exchange, the Gardener's Information Service, the Living Lab program for children, and The Growing Connection.

Building on their experiences at River Farm, many interns have gone on to earn advanced horticulture degrees and pursue a wide variety of careers in the green industry. Former AHS interns are now working all over North America and even overseas, enjoying fulfilling careers at botanical gardens, in university research programs, as landscape designers, teaching in the Peace Corps, and writing for gardening magazines.

THE WRITE STUFF

One of the first interns to participate in the AHS program has since parlayed his gardening knowledge and passion into a successful career in garden writing with *Southern Living* magazine.

Steve Bender interned at AHS in the summer of 1979, working with two full-time groundskeepers to care for River Farm's gardens and buildings. Back then, according to Steve, parts of the grounds were wild and overgrown. "One of my great missions was to tame the gardens and hack back the jungle," Steve recalls. "I was cutting everything down, beating back the woods, so to speak. It was like cleaning the frescos at the Vatican."

Despite his enthusiasm, Steve's passion



Steve Bender is now a garden writer and editor at *Southern Living* magazine and books.

for beautifying the gardens was tempered from time to time. One of his more painful memories of River Farm is recounted hilariously in *Passalong Plants*, an award-winning book Steve coauthored with current AHS Board member Felder Rushing. Steve was on a ladder pruning an overgrown hardy orange (*Poncirus tri-*

foliata) when the ladder slipped off a windowsill, impaling him on the plant's three-inch thorns, which, he writes, were "waiting to extract every drop of blood from my body."

After his internship, Steve graduated from the University of Maryland with a degree in horticulture. He went on to work for Homestead Gardens in Davidsonville, Maryland, then joined the Garden Writers Association and started doing some free-lance writing.

Soon after, he discovered *Southern Living* was in need of a garden editor from the Washington, D.C., area. Needless to say, Steve got the job and, 20 years later, the rest is history. Now a senior writer at *Southern Living*, Steve is doing everything from feature articles to travel pieces. He is also the editor of *Southern Living* gardening books, which this year will include plants coded for the first time with AHS Plant Heat zones.

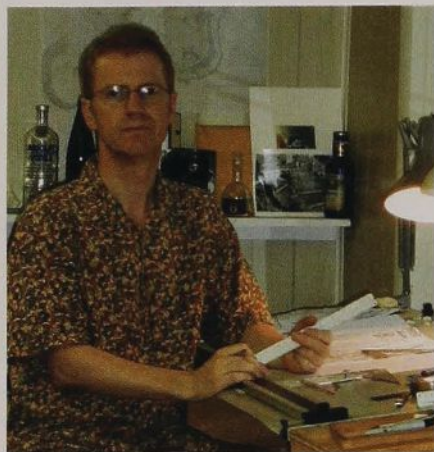
Steve attributes his success as a garden writer to his educational background in horticulture and the practical experience he gained working at places such as AHS. Overall, he remembers the AHS internship as an opportunity to learn about different plants and receive a well-rounded work experience rather than being stuck in a greenhouse watering plants all day. For prospective interns, Steve advises, "Try as many different things as you can and get involved with as many activities as possible. You can sit in a classroom all your life, but there is no substitute for getting out there and learning about things firsthand."

The AHS Internship program is not supported by any membership dues. Instead, the program relies on generous donations from individual members and organizations. For more information about internship opportunities with AHS, or to make a donation to the program, call (800) 777-7931, extension 136, or visit the AHS Web site at www.ahs.org.

DESIGNS FOR SUCCESS

Another former intern, Alastair Bolton, is doing his part to make the world a more beautiful place. His background in architecture coupled with his experience with plants eventually led him to establish his own garden design business in the Washington, D.C., metropolitan area.

Originally from England, Alastair was unfamiliar with native American plants when he came to River Farm in 1991. "It was a great introduction to East Coast



Former horticultural intern Alastair Bolton at his garden design studio desk.

American horticulture, and AHS was a steppingstone to a two-year fellowship at the National Arboretum in Washington, D.C.," Alastair notes.

In addition to fulfilling all the regular horticultural tasks at River Farm, Alastair found time during his internship to do illustrations for the AHS magazine, which at the time was named *American Horticulturist*. "Interning at AHS is a great first step into horticulture and can be an excellent platform leading to other opportunities," he says.

EXPANDING HORIZONS

Many former interns say their experience at AHS, as well as the mentoring and contacts provided by AHS staff members, helped guide them into a particular graduate program or career path.

■ Elizabeth Pettit, who interned at AHS in 1997, is now a doctoral student in the plant physiology and molecular biology program at Iowa State University (ISU). Her decision to attend ISU was spurred by her experience at River Farm, where



Elizabeth Pettit, second from right, with fellow AHS interns Kathryn Swaim and Erika Dilley (left to right) and then Director of Horticulture Mark Miller in 1997.

she met fellow intern and ISU student, Erika Dilley, who raved about her school's plant sciences curriculum.

Future interns should learn all they can about the plants at River Farm, Elizabeth advises, because the information can be useful in more ways than one. "You'll always draw on that knowledge, if not in your career, then in your appreciation of the world growing around you," says Elizabeth.

■ For the past three years, Kelly Wilson's job has allowed her to appreciate nature on a daily basis. As the cutting garden manager at Hillwood Museum and Gardens in Washington, D.C., Kelly plants out seedlings, organizes the garden, and uses cut flowers to create arrangements displayed in the Hillwood house.



Kelly Wilson, cutting garden manager, Hillwood Museum and Gardens

After Kelly's year-long internship at AHS ended in 1997, she went on to pursue a degree in horticulture at Virginia Tech. Her experience at AHS introduced her to public gardens and inspired her to continue working with people to educate them about horticulture and the benefits of gardening.

■ This fall, former AHS intern Aliya Donnell is embarking on her master's degree in horticultural science at North Carolina State

University in Raleigh. According to Aliya, the internship with AHS helped her understand the practical side of horticulture as opposed to the scientific aspect that she learned about in her undergraduate course work. Aliya encourages future interns to



Aliya Donnell in the meadow at River Farm during her AHS internship in 2002.

"have a positive attitude, be willing to work, be willing to learn, be willing to admit when you don't know something, and don't be afraid to ask questions."

PROGRAM BRANCHES OUT

Two years ago, the internship program at River Farm expanded to include an opening for an editorial intern to work with the staff of *The American Gardener*, AHS's official membership publication. Several interns, including myself, have already taken advantage of the opportunity to gain invaluable writing and editing experience with a four-color, national gardening magazine.

Free-lance writer Pia da Silva is a former editorial intern with The American Gardener.

ornamental ALLIUMS

BY CAROLE OTTESEN

For discerning gardeners, ornamental onions are indispensable additions to the spring and summer bulb display. And now's the perfect time to plant them.



SAY “BULBS” and the first things to pop into a gardener’s mind are tulips, daffodils, and crocuses. Alliums are an afterthought. In spite of remarkable attributes—showy flowers that are great for cutting and drying, easy culture, exceptional hardiness, deer and vole resistance—alliums seem to be the Rodney Dangerfields of the plant world.

This is hardly a new phenomenon. “Alliums are not so popular in gardens as on many counts they deserve to be,” wrote Louise Beebe Wilder in her 1936 classic *Adventures with Hardy Bulbs*. A half century later, Dilys Davies, author of *Alliums, the Ornamental Onions*, put it more forcefully, describing the genus as “underservedly neglected...attracting a smallish circle of enthusiasts, plus the odd fanatic.”

It’s hard to single out one reason why these spectacular bulbs are not more roundly appreciated, but perhaps it has something to do with their culinary associations. I grew culinary onions—chives, onions, shallots, and garlic—for years before I got around to trying the purely ornamental side of the family.

I remember clearly that the first ornamental onion to come into my garden was a dim second choice. First choice had been the June-blooming giant alliums (*A. giganteum*) with their magnificent six-inch flower heads. I had dreamed of a flock of them, but when I learned how expensive a single bulb was, in a momentary paroxysm of parsimony, I opted for a dozen of the cheaper Persian or “tall drumstick” alliums (*A. aflatunense*). Thus it was that on

A reliable bloomer, the Persian allium (*A. aflatunense*) thrives in a well-drained site.

KEN MEYER



Giant allium (*A. giganteum*), above, floats majestically above other perennials in the June garden. Right: 'Mt. Everest' is a showy hybrid with huge balls of white florets.

a brilliant October day, while popping in bulbs between clumps of fountain grass (*Pennisetum alopecuroides*) that instead of feeling euphoric, I fretted: Why hadn't I just bought what I had intended to buy in the first place? How could 12 bulbs that sold for the price of three be anywhere near as showy?

The following May proved those worries unfounded. Four-inch balls made up of hundreds of tiny purple florets rose on three-foot stalks through a ground cover of emerging fountain grass. Not only were Persian alliums a bargain, they were spectacular. And combining them on a low mound with an ornamental grass turned out to be a stroke of dumb luck. The drainage is good—a requirement of this summer-dormant bulb—and I hadn't known that the grass would camouflage bulb foliage that yellows just as the flowers appear. My Persian alliums are attractive, healthy, and have returned in greater numbers every spring for more than a decade, although the flowers have declined somewhat in size. And it's a combination that mystifies visitors to



the garden who ask, "What is that grass with those amazing flowers?"

BIG-HEADED ALLIUMS

Persian alliums belong to a group that I've come to think of as the "big-headed alliums," an unscientific but descriptive name that encompasses some showy types of

horticultural origin and mixed parentage.

One of these, 'Purple Sensation'—to my eye identical to Persian allium but for its deep, dark violet purple color—is often listed as *A. hollandicum*. Crosses of Persian allium with other species have produced a bevy of beauties with attributes that blur the distinctions between species. A cross of *A. aflatanense* with *A. macleanii* produced 'Gladiator', a rose-purple hybrid, and 'Lucy Ball', a dark lilac-purple selection. 'Rien Poortvliet' is an amethyst-violet-flowered sport of 'Gladiator.'

Allium 'Mars' is a spectacular hybrid that bears six-inch-wide lavender-purple umbels. Three to four feet tall, it flowers in late spring. 'Mount Everest', with six-inch-wide pure white snowballs, is an excellent tall selection.

Of course, the poster child of the big-headed alliums is *A. giganteum*, the one I had originally lusted after, smitten by a catalog photo of a softball-sized flower dwarfing a child. The fall after the May-of-the-Persian alliums, I made haste to the garden center and spent a small fortune on giant alliums.

Significantly larger than Persian alliums, giant alliums have celebrity presence. In the June border, six-inch balls of dark lavender florets on four-foot stems float majestically above lower-growing perennials. An equally attractive white form, 'White Giant', is also available. Blooming slightly later than Persian alliums, these giant alliums extend the display and cutting season.

While Persian alliums provide big, bold additions to late spring bouquets, giant alliums are bouquets in themselves. If you plant both, you'll have two months of terrific cut flowers that bring long-lasting substance to bouquets and even preserve well as dried flowers.

These two species flower in concert with the late-spring-to-summer crowd, including Virginia bluebells (*Mertensia* spp.), late daffodils and tulips, honesty (*Lunaria* spp.), bleeding hearts (*Dicentra* spp.), columbines (*Aquilegia* spp.),

Right: Elegant leaves precede the white flowers of Turkistan allium (*A. karataviense* 'Ivory Queen'). Below: Starbursts of *A. schubertii* blend in color and contrast in form with ornamental cabbages.

Brunnera spp., peonies, and oriental poppies. After bloom, balls of quivering seed heads remain attractive while discreet foliage, amazing in plants that make such an impact, departs with courteous dispatch and little mess.

Giant allium is sometimes named, along with *A. stipitatum*, as a parent of the traffic-stopping 'Globe Master', a Guinness-Book candidate with blooms eight to 10 inches across. Other sources credit this cultivar's size to the species with huge heads of loose, shaggy florets, the star of Persia (*A. christophii*, formerly *A. albopilosum*). Star of Persia bears eight-inch balls of metallic blue-violet florets on rather disproportionate 15-inch stems. Thriving in a hot spot, it is said to require rather alkaline soil and, like most alliums, demands excellent drainage.

Bigger, but skeletal in flower is *A. schubertii*, which seems too outrageous to be real—an explosion of rosy florets caught in mid-air on an 18-inch stem. I always think of this one as "the tumbleweed allium," because I have read that in its native places—North Africa and central Asia—the dried flower heads eventually break off the withered stems and, blown by the wind, cast their seeds abroad as they roll. Drainage is critical for this summer-dormant allium; I have lost several to long, hot, wet summers. Prudent souls might lift these bulbs after flowers have faded and replant them in fall.

The Turkistan allium (*A. karataviense*) hails from a land-locked region in central Asia characterized by harsh high desert plateaus, semi-arid steppes, and the world's tallest mountains. Finicky about drainage, but excellent in the rock garden, the Turkistan allium's elegant appearance belies its robust constitution.



Of all the alliums, this one has the finest foliage, arguably more attractive than the flowers. Two or three elegantly-curved, broad leaves appear in May. They are rigid and ridged, casting shadows that read as pale purple stripes on matte blue-green leaves. The silvery pink flowers on eight-inch stems are sometimes grown for their dried inflorescences as well as fresh material. To my eye, 'Ivory Queen', a white flowered form, contrasts more smartly with the leaves.

THE SMALL-HEADED ALLIUMS

Smallish alliums make up the preponderance of the estimated 800 to 1,000 allium species worldwide. Among these are *A. zebdanense*, a rock garden candidate with inch-wide demure white flowers on 15 inch stems; drumstick allium (*A. sphaerocephalum*), which has egg-shaped dark cerise flower heads; and blue garlic (*A. caeruleum*, sometimes listed as *A. azureum*), which bears one- to two-inch flower heads the steel blue of a stormy sky on 18-inch stems. Blue garlic is wonderful coming up through and around low, sprawling plants such as sage, veronica, and soapwort (*Saponaria* spp.).

Lily leek (*A. moly*), a hardy southerner with cheerful, clear yellow, two-inch flower heads that bloom in May to June, will naturalize in part and even dry shade. 'Jeannine' is a form that usually produces two flower stalks instead of one.

While lily leek is hardy far north of its Iberian origins, the loose-flowered white Naples garlic (*A. neapolitanum*) isn't. Native to sunny, dry soils in Portugal and around the Mediterranean, its bulbs will rot in wet clay, but will adorn a baking "hell-strip" site with grace and charm, growing 15 inches tall, spreading happily, and exuding a sweet fragrance, atypical for alliums. Another white allium, sold as *A. cowanii*, is reputed to be a better form of *A. neapolitanum*. Its full heads of fragrant, dazzling snow-white flowers on 10-inch stems are truly sensational.

Small-flowered alliums are easily lost in



Lily leeks (*A. moly*) hail from the Iberian peninsula but withstand the cold of northern gardens.

the garden unless they are massed. Happily, many small alliums multiply quickly. Some, like *A. caeruleum*, spread by setting seed and/or multiplying bulbs—just enough to make a good show. But others can become outright pests once established, as anyone who has tried to get rid of that ubiquitous lawn weed, wild garlic (*A. vineale*), knows. “Under no circumstances should one plant out an allium bearing bulbils in the head or with numerous bulblets surrounding the base of the stem,” warns Davies.

NATIVE ALLIUMS

About 100 alliums, primarily small-flowered, are native to North America. Of these, the easiest to procure and, perhaps, to grow is the nodding onion, (*A. cernuum*). True to its name, this onion nods,

almost as if its neck were too weak to hold up heads in all shades of pink that appear in July on 15-inch stems. A cultivar, ‘Alba,’ has white flowers. Unusual because it produces several flowering stalks in succession, the nodding onion provides excellent cut flowers.

Other native alliums are harder to find, but can be obtained through specialty nurseries and the seed exchanges of the North American Rock Garden Society and other plant societies. These include species such as Douglas’ onion (*A. douglasii*), from the Northwest, which has pretty pink and white flowers; *A. bolanderi*, a compact species from the Siskiyou Mountains with dark, rose-red flowers; *A. goodingii*, a gray-leafed dryland species with deep purple spring flowers from Arizona and New Mexico

CARING FOR ALLIUMS

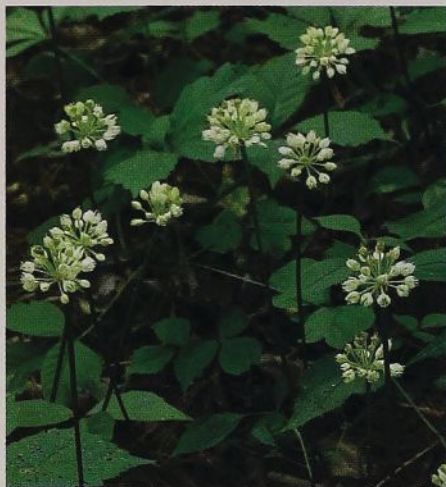
Fall is the perfect time to plant alliums, which, like most temperate-zone bulbs, require a period of cold dormancy to grow well and bloom. You can plant them anytime before the ground freezes, using the standard planting guideline of having the top of the bulb at a depth three times its diameter.

Most alliums originated in regions that experience hot, dry summers and very cold winters. And many are native to steppe, scree, or mountain habitats where the soil is thin and porous. So it’s hardly surprising to learn that nearly all alliums—particularly those with larger bulbs—grow best in free-draining soil. If all you have is wet clay, you’ll have to create a raised bed for your alliums or amend vigorously with organic matter and/or chicken grit (you can find the latter at a farm supply store). A site in full sun is necessary for all but the woodland species.

If alliums are a bit demanding about drainage, they make up for it by withstanding extreme cold. I discovered just how hardy alliums are this summer during a visit to the botanical garden at the University of Turku, Finland’s ancient capital, where I encountered a riot of alliums, including giant allium, Turkistan allium, and cultivars such as ‘Mars’ and ‘Purple Sensation’. This garden is located north of 60 degrees northern latitude (approximately equivalent to the border between the Canadian provinces and the Northwest Territories, which equates to Zone 2 or 3 on the older version of the USDA hardiness map).

A number of alliums have foliage that yellows as flowers appear. Planting these among lower-growing perennials, such as hostas, keeps the bed looking trim.

Propagate alliums by dividing them in spring or fall. Most species need to be divided every few years to prevent overcrowding. —C.O.



Nodding onion (*A. cernuum*), left, bears drooping flower clusters. Ramps (*A. tricoccum*), above, produce onion-scented flowers if their edible bulbous roots are not harvested beforehand.

that disappears in summer and resumes growth in fall; and the prairie onion (*A. drummondii*) from the Great Plains with white, pink, or red flowers.

A plant's place of origin gives valuable cues to its care and placement in the garden. When a friend brought me bulbs of *A. texanum*, an 18-inch white-flowered species from Texas, I planted them on a sun-baked, rocky hill where, with good drainage, they have prospered. As do the preponderance of alliums worldwide, the

majority of our natives seem to originate in the West on rocky slopes in areas with spring rains and summer drought. But there are exceptions.

WOODLAND ALLIUMS

Ramps or wild leeks (*A. tricoccum*), familiar to residents and hikers in mountains and woodlands from Minnesota to Georgia, are both edible and beautiful wildflowers with onion-scented white flowers that carpet low, wooded slopes. Ramps

frequently grow into large colonies, a fortunate trait because they are the subjects of that Appalachian rite of spring, the ramp fest. Those that avoid being consumed by revelers flower in July.

Wood garlic, also called ramsons (*A. ursinum*) grows in moist, shady woodlands of Europe, where it is the main ingredient in traditional cream soups and risotto and thought to share garlic's medicinal properties. It spreads rapidly, however, covering entire woodlands with snowy spring flowers, and has the potential to be invasive in North America.

Slightly less vigorous, another white woodlander, the three-cornered onion (*A. triquetrum*), bears drooping clusters of dangling bells on 15-inch triangular stems.

HEIRLOOMS

A few ornamental alliums have been around long enough to achieve heirloom status. The above-mentioned white-flowered onion has graced gardens since at least the time of 17th-century English herbalist John Parkinson, who called it "three-cornered Moly." Other old garden favorites, having fallen from fashion, are coming back into vogue. Two-toned heirlooms include pretty *A. rosenbachianum*, which has rose florets starred with white stamens, and *A. nigrum* (sometimes listed as *A. multibulbosum*), which has white

Sources

Beaver Creek Greenhouses, 4155 Deep Lake Boundary Road, Colville, WA 99114. (In Canada: Box 129 Fruitvale, British Columbia V0G 1L0, Canada.) www.rockgardenplants.com.

Brent and Becky's Bulbs, Gloucester, VA, (804) 693-3966, www.brentandbeckysbulbs.com. Catalog free.

John Scheepers, Inc., Bantam, CT, (860) 567-0838, www.johnscheepers.com. Catalog free.

North American Rock Garden Society, www.nargs.org.

Resources

California State University at Berkeley has a good site that includes information on many native alliums: <http://elib.cs.berkeley.edu/photos/flora/sci-A.html>.

Adventures with Hardy Bulbs by Louise Beebe Wilder, Lyons Press, Guilford, Connecticut, 1998. (Originally published by Macmillan, 1936.)

Alliums: The Ornamental Onions by Dilys Davies, Timber Press, Portland, Oregon, 1992.

Bulbs (revised edition) by John E. Bryan, Timber Press, Portland, Oregon, 2002.



Native to Turkistan, *A. oreophilum* is a diminutive old garden favorite.

A QUICK GUIDE TO ALLIUMS

Name	Height (feet)	Flower color	Bloom period	USDA/AHS Zones
FOR FLOWER BORDERS				
<i>A. aflatunense</i> (Persian allium)	2½–4	purple	May	4–8, 8–1
<i>A. caeruleum</i> (blue garlic)	1–2	smoky blue	May to June	4–10, 10–1
* <i>A. cernuum</i> (nodding onion)	1–1½	pink	July to August	3–9, 9–5
<i>A. christophii</i> (star of Persia)	1–1½	metallic violet	May to June	3–9, 9–5
<i>A. flavum</i>	1	yellow	July to August	4–10, 9–1
<i>A. giganteum</i> (giant allium)	4	purple	June	3–9, 9–5
'Gladiator'	4	rose-purple	June	4–8, 8–1
'Globe Master'	3½	purple	May to June	4–8, 8–1
'Lucy Ball'	3–4	purple	May to June	3–8, 9–1
'Mars'	3–4	lavender-purple	May to June	4–8, 8–1
<i>A. moly</i>	1	bright yellow	May to June	3–9, 9–1
<i>A. neapolitanum</i> (Naples garlic)	1–1½	white	April to June	7–9, 9–7
<i>A. nigrum</i>	1½	white and green	May	5–8, 9–1
<i>A. oreophilum</i>	1	deep rose	May to June	4–9, 9–1
'Purple Sensation'	1½–2½	violet purple	May to June	4–9, 9–1
'Rien Poortvliet'	3–3½	purple	June	4–8, 9–1
<i>A. rosenbachianum</i>	3–4	rose and white	May to June	4–10, 10–1
<i>A. schubertii</i>	1½–2	silvery pink	June	4–10, 10–1
<i>A. sphaerocephalum</i> (drumstick allium)	1½–2	maroon to purple	June to July	4–11, 12–1
<i>A. thunbergii</i> 'Ozawa'	½–1	rose pink	September to October	3–8, 9–1
* <i>A. unifolium</i>	1–1½	pale pink	May to June	4–9, 9–1
FOR ROCK GARDENS				
<i>A. karataviense</i> (Turkistan allium)	½–1	silvery pink, white	May	3–9, 9–5
<i>A. zebdanense</i>	1½	white	May to June	4–9, 9–3
FOR WOODLAND GARDENS				
* <i>A. tricoccum</i> (ramps)	1½–2	white	June	3–8, 9–1
<i>A. triquetrum</i> (three-cornered onion)	1–1½	white/green	May	5–9, 9–4

*Alliums native to North America are noted with an asterisk.

florets with green eyes composing four-inch balls.

Despite its mountain origins, *A. oreophilum* (usually listed as *A. ostrowskianum*) is an easy-to-grow old garden form with deep rosy pink shuttlecock-shaped flowers on six-inch stems.


FINALLY GETTING SOME RESPECT?

It may be my imagination, but it seems that more and rarer species of ornamental alliums are becoming available commercially. Last year, I found *A. thunbergii* 'Ozawa', a fall-bloomer from Japan that has pink flowers and thread-leaf foliage

that colors orange, and *A. flavum*, an heirloom with yellow flowers that look like exploding fireworks on 12-inch stems. Another uncommon allium I ran across is the one-leaved onion (*A. unifolium*), native to cool, moist coastal ranges of California and Oregon and thus more tolerant of moisture than most alliums. Despite its name, it has *two* leaves and nodding cotton-candy pink flowers on 15-inch stems.

Perhaps I am seeing a greater variety of alliums because I am attuned to them and, actually, well on my way to becoming one of the "odd fanatics" Davies de-

scribes. But it would be nice to think it's because they are finally receiving the recognition they deserve. There is certainly good reason for this: Just the fact that they are gorgeous and deer resistant elevates them to star status in my garden.

In addition, most are extremely hardy, cut and dry well, reproduce handily, and are easy to grow. That they exit quietly and neatly after bloom—without messy, endlessly-photosynthesizing, floppy foliage—puts them over the top. 

Carole Ottesen is an associate editor of The American Gardener.

BY MARYALICE KOEHNE

PHOTOGRAPHY BY MARY JO WALICKI

Living Large



in a Small Garden



Two homeowners in Milwaukee converted a small urban yard into multiple garden rooms—without spending a fortune.

THE REFRESHING gurgle of water bubbling from fountains in the pond echoes in the quiet of the garden as a pair of black-capped chickadees chirp in the silver foliage of the olive tree. A monarch butterfly lands on a nearby purple coneflower while bees buzz around lavender and chives in the herb garden and several large goldfish surface in a pond. It's a lazy summer afternoon, perfect for enjoying nature's treasures by idling on the bench near the arbor or sipping a tall glass of iced tea.

This sounds like a description of a large estate garden, but it's all in Marianne and Burton Montag's narrow 45-foot-by-160-foot urban lot in Milwaukee, Wisconsin. The retired couple live in a small duplex, but by creatively turning a standard lawn and parking area into a series of garden retreats, they have maximized their ability to spend time outdoors.

In addition to the pond and arbor, their small lot contains a swimming pool, a greenhouse, a screened garden house, several perennial beds, a patio, an arbor, a small patch of lawn, and a vegetable garden. The backyard is so well furnished that it is hard to believe practically everything in it has been acquired as discarded or found items at minimal or no cost.



Opposite: The entranceway to the Montags' backyard is framed by an arbor made from latticework that originally was destined for the trash bin. **Top:** An aboveground swimming pool is edged with blue-and-white tiles that reflect the garden's predominant color scheme. **Above:** Marianne Montag harvests fennel in her herb garden.



PERSONALIZING WITH RECYCLED MATERIALS

It's a tribute to imagination and the spirit of gardening that so many different spaces flourish in this small backyard garden. Here, recycled treasures gleaned from various sources delight the owners just as costly antiques do in other settings.

The turn-of-the-20th-century greenhouse attached to the garage at one corner of the yard is a case in point. The nine-by-15-foot greenhouse was once part of a now-defunct local nursery. When the structure's usefulness was superseded by modern innovations, it was dismantled, and all the glass panes and hickory framing was stored in boxes. That's where it remained for years until finally, through word of mouth, the Montags heard about it and purchased it for \$300.



Above: The greenhouse, a \$300 bargain, is now an enclosed living area adjoining the garage. **Above left:** A small pond near the greenhouse is framed in salvaged used bricks.

Now the greenhouse once again provides room for growing plants as well as space for people to relax and enjoy the garden. The Montags especially enjoy being outdoors in early spring and late fall, and they welcome the shelter provided by the greenhouse on cool days.

Using recycled or found objects is a frugal way to decorate, but Marianne says, "There's more to it than just saving money. I love finding some old discarded thing and giving it new life." She adds, "But some discarded items come to me

at zero or minimal expense, and then it costs a lot to have them restored." The greenhouse, for example, cost more than \$1,500 to install.

"Gardens with recycled objects have a sense of spontaneity and whimsy lacking in more rigid designs," says horticulturist Stuart Dempsey, owner of Walnut Hill Ltd., who sometimes helps Marianne when she needs landscaping advice.

The Montags prefer the charm of one-of-a-kind adaptations. Every cherished item in this garden has a story. Open the stylized metal garden gate made from a 1950s room divider—rescued from the a basement storage room—and you'll step onto a path made of bricks donated to the garden by a relative. Then you pass through an inviting arbor designed from latticework that one of Dempsey's other clients wanted hauled to the dump. Painted a perfect shade of apple green, the arbor harmonizes with bordering hydrangeas and ferns. For the vegetable and herb garden, Burton found, sized, and installed a used picket fence. The pond is edged with flagstone that was discarded by a friend.

The greenhouse, a screenhouse in which the Montags dine each summer night, and other seating areas on the patio



The Montags' vegetable garden is enlivened by rudbeckias and a lighthouse sculpture.



On a patio across from the Montags' greenhouse, container-grown ferns, ornamental grasses, and assorted flowering plants share space with many of the couple's found and recycled objects.

are filled with furniture and accessories gleaned from rummage sales and flea markets. Marianne says she gets ideas from photographs in gardening magazines and newspapers for adapting unlikely items for her garden rooms. One favorite find is an old gym locker with shelves already installed. It holds dishes, napkins, and accessories for outdoor living and entertaining.

UNIFYING WITH COLOR

Marianne emphasizes that an important aspect of all her decorating projects is working with colors. In a small space made of so many different living areas, the judicious use of color provides a unifying theme that prevents a feeling of chaos.

In the garden, Marianne uses only blue and white accessories against nature's green as a foil, so everything in the garden blends harmoniously. Also tying the garden together are plantings with silver foliage like 'Munstead' lavender, artemisia, snow in summer (*Cerastium* spp.), and the foliage of a Russian olive tree (*Elaeagnus angustifolia*). The tree and several shrubs were

originally planted to camouflage an above-ground swimming pool that came with the house when the Montags moved in decades ago; it is now further disguised by apple-green decks and the arbor.

"People living in smaller spaces don't have to sacrifice taste and design," Marianne says. "Anyone can develop a sense of design and personal style. The same principles of interior design can be adapted to garden rooms."

And it's fun, economical, and good for the environment to add recycled materials to your garden. However, once begun, ventures like this tend to keep on going forever. "Even though I thought my landscaping was finished, a friend just dismantled a retaining wall and brought over three truckloads of stones," says Marianne. "Now my next project may well be a rock garden in the front yard where the property slopes. It all depends on what falls into my hands and what I dream up."

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

MARIANNE MONTAG'S TIPS FOR GARDEN DECORATING ON THE CHEAP

- For larger objects, broken concrete, or architectural details such as pillars, check the Yellow Pages under "Architectural," "Building Materials—Used," or even "Concrete-breaking, sawing and cutting" and "Salvage Companies."
- For smaller items, check rummage sales, end-of-the season sales in retail stores, and even in trash left for collection on curbs. Once friends know what you're up to, they're likely to offer all kinds of things!
- Wash or sterilize everything you bring home to make it your own.
- If you see a garden being dismantled, don't hesitate to ask for leftovers or discards. That's how Marianne acquired some favorite large stone pots now in her garden.



Heteromeles arbutifolia

Decorative

As the last flowers of
summer exit the garden,
it's time for autumn
berries to put on a show.

BY RITA PELCZAR


OBSERVED IN BROAD STROKES, autumn is the season of earth tones, as the green leaves of deciduous trees and shrubs modulate into shades of gold, burgundy, burnt orange, and brown. In the garden, tan and brown seed heads have replaced many of summer's flowers, and the tawny leaves and amber plumes of ornamental grasses contribute their graceful textures and tones to the earthy mix.

Upon closer inspection some surprising splashes of bright color peek out from among the lingering leaves. Shiny berries ranging from the deepest purple to patent leather red and bright white insist on being noticed. Where earlier in the year flowers graced these branches, they now support fruit, much of which attracts and nourishes a variety of wildlife.

Although seed filled bird feeders will accommodate many avian visitors, birds such as robins, bluebirds, and cedar waxwings never eat seeds. By including a few fall fruiting trees and shrubs in your landscape, you not only add spice to the transition of seasons, you also provide sustenance for birds and other wild visitors as they prepare for the winter.

Partly as a result of their attractiveness to wildlife, fall berries often disappear before winter sets in. But while they are present, they provide a bold accent to those earth tones.

A southern California native known as *toyon* or **California holly** (*Heteromeles ar-*



Phytolacca americana

Autumn Berries

butifolia, syn. *Photinia arbutifolia*, USDA Hardiness Zones 8–10, AHS Heat Zones 12–8) receives high marks for both its ornamental and wildlife-supporting properties. This dense, evergreen shrub can reach 25 feet, although 10 is more typical in a garden setting. Its leathery, four-inch leaves provide contrast to the flat clusters of creamy white flowers in late spring. By mid autumn the flowers transform into bright red berries that are favored by California quail, northern mockingbird, American robin, cedar waxwing, western bluebird, and black-headed grosbeak. It adapts to most soil types, and is tolerant of some shade and drought.

Pokeweed (*Phytolacca americana*, Zones 5–9, 9–5) is a native perennial that can grow six feet or taller. It has a coarse habit, with purplish stems, broadly lance-shaped leaves, and white summer flowers followed by shiny, dark purple berries from late summer to early fall. Pokeweed's stature and colorful stems and berries can be a striking addition to a naturalistic garden, but be sure to remove and dispose of the berries before they fall to prevent rampant seeding. Although pokeweed's berries are eaten by a wide range of birds and mammals, most sources warn that they—along with the plant's fleshy roots—are poisonous if ingested by humans.

At ground level, the dark, rounded leaves of **rockspray cotoneaster** (*Cotoneaster horizontalis*, Zones 4–7, 7–3) take on a reddish tint in the fall and serve as a handsome



Cotoneaster horizontalis



Cornus canadensis

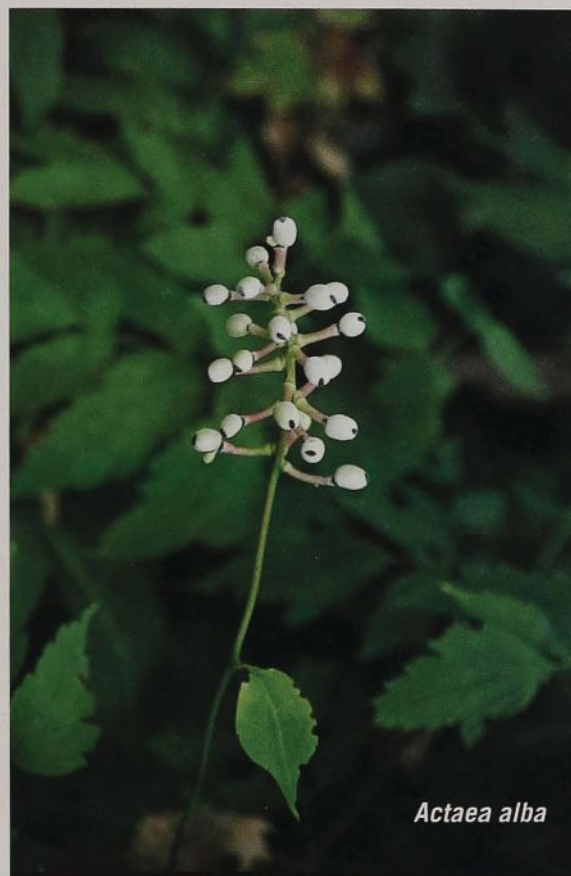
background for the bright red, pea-sized berries that begin to show their color in August and persist—unless they are eaten first—until October. Growing two to three feet high, this ground-covering shrub rambles over rocks or down a hillside with strong, horizontal branches that spread five to eight feet. Nearly the entire length of each stem is dressed in fruit. The fruit is eaten by several species of birds, and the web work of branches provides shelter for a variety of garden visitors.

Bunchberry (*Cornus canadensis*, Zones 2–7, 7–1) is a deciduous ground cover for regions where summers are mild. When it is properly sited in a cool, part or fully shaded spot with moist, acidic, organic-rich soil, it can form a dense, wide-spreading carpet of whorled leaves that turn from bright summer green to deep autumn red. It grows six to nine inches tall. Its early summer flowers, with their attractive, pink flushed, white bracts, are followed in August by terminal clusters of quarter-inch diameter, scarlet fruit that a variety of birds adore.

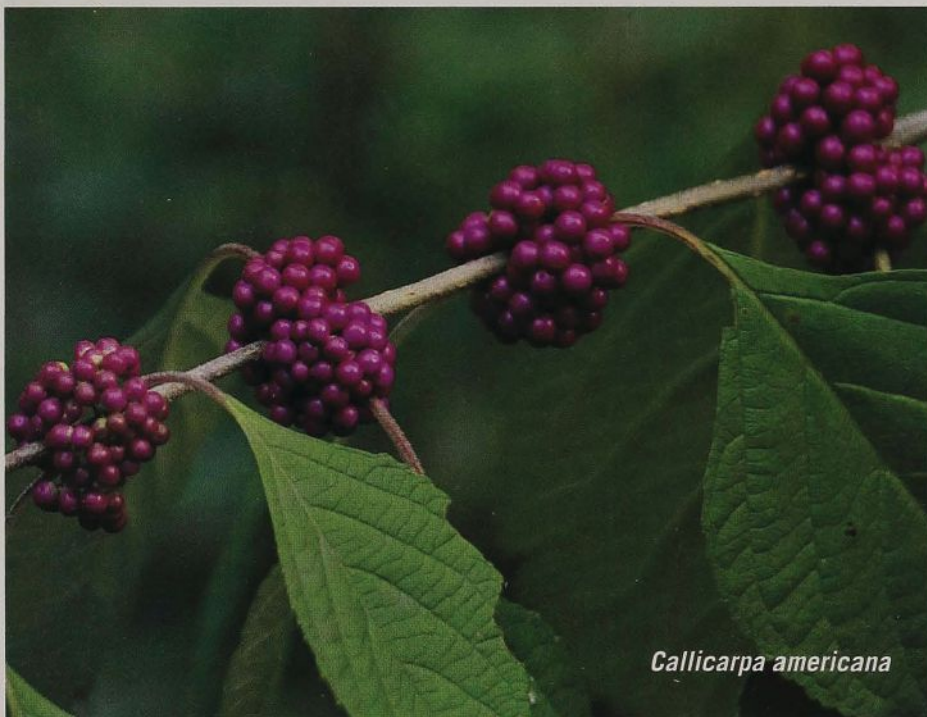
A related species, the **gray dogwood** (*C. racemosa*, Zones 4–8, 8–3) has an upright habit, and can grow to 15 feet in



Cornus racemosa



Actaea alba



Callicarpa americana

More Fall Berries

Arbutus unedo
Aronia arbutifolia
Callicarpa bodinieri var. *giraldii*
Euonymus americanus
E. atropurpureus
Gaultheria procumbens
Ilex 'September Gem'
Nandina domestica
Pernettya mucronata and cultivars
Sapindus drummondii
Sorbus decora
S. vilmorinii
Symphoricarpos albus
Symplocos paniculata
Viburnum dilatatum 'Erie'
V. dilatatum 'Michael Dodge'
V. nudum 'Wintherthur'

height, with an equal width. Its white spring flowers give way to bright white fruit that are held on red stems and attract both birds and squirrels.

The native **white baneberry** (*Actaea alba*, syn. *A. pachypoda*, Zones 4–9, 9–1) puts on a fine show in a moist, shady lo-

cation. This clump forming perennial grows two to four feet tall and bears fluffy, rounded, white flower clusters in late spring and early summer. As autumn approaches, the flower stems thicken and turn red while pea-sized white berries—each with a purple-black “eye”—form in

elongated clusters. The berries are poisonous to humans, and are not sought after by wildlife, either—this one is recommended as a “deer-proof” plant.

The common name **American beautyberry** (*Callicarpa americana*, Zones 5–9, 9–1) says it all. This native



Pyracantha sp.



Rosa rugosa

shrub produces clusters of bright purple fall berries along its slender stems, and their color is enough to take your breath away. But if purple is not for you, the cultivar 'Lactea' bears white berries. This is an adaptable shrub for any well-drained soil in full sun or partial shade.

There are seven species of *Pyracantha*, all indigenous to Asia and southern Eu-

rope. Commonly known as firethorns, these semi-evergreen shrubs are armed with spines along their stiff, angular stems. In spring they produce white flowers, but it is in autumn that they put on their best show, producing colorful, persistent fruit in profusion.

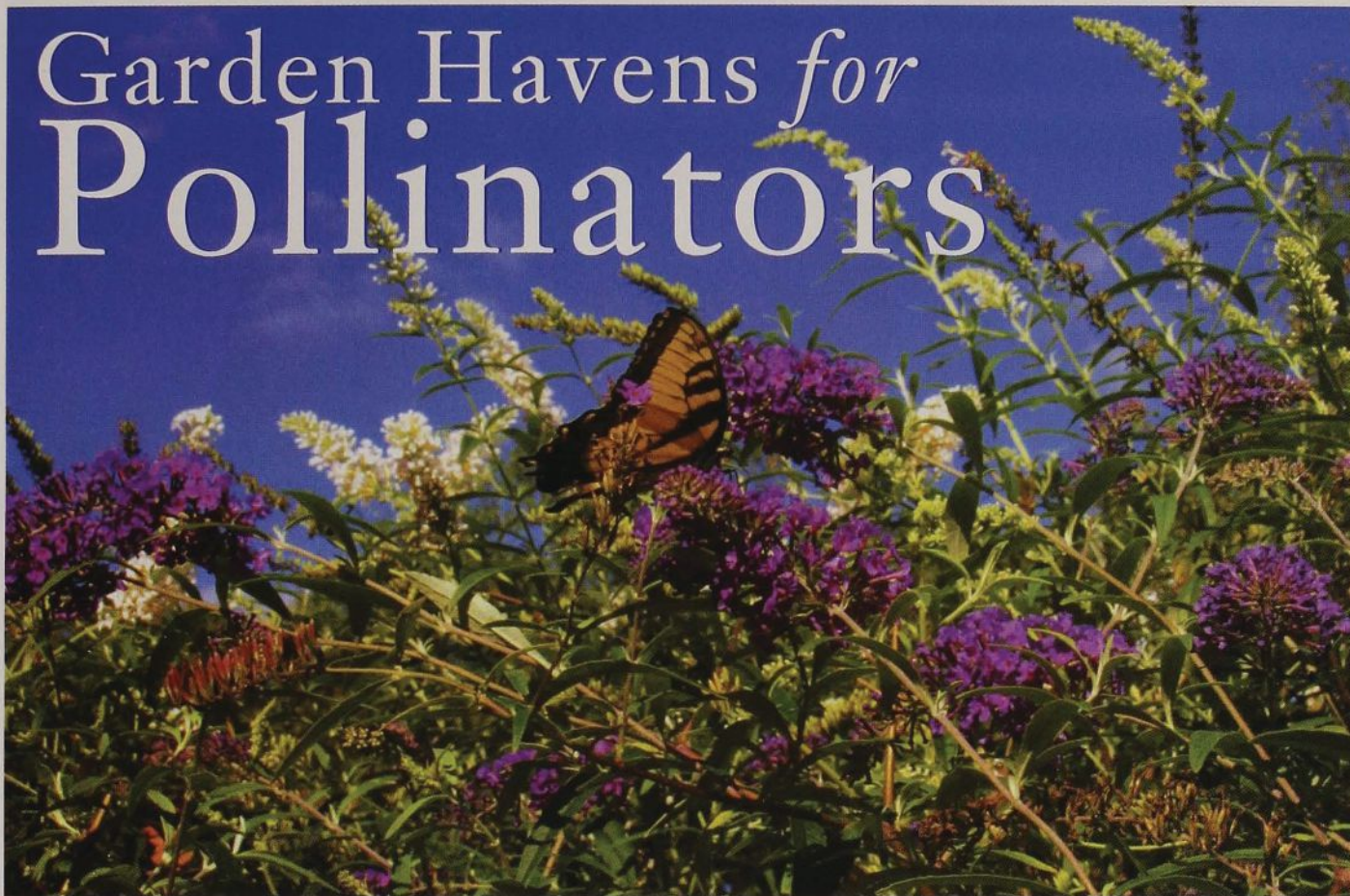
Cultivars of **scarlet firethorn** (*P. coccinea*, Zones 6–9, 9–6) grow from six to 18

feet tall, and bear fruit in intense shades of yellow, orange, or red. Favored by robins, jays, thrashers, waxwings, catbirds, cardinals, mockingbirds, and thrushes, the berries are often passed over early in the season. But when the waxwings finally home in on the firethorn outside my kitchen window after the weather turns cold, the berries disappear in two days! *Pyracantha* requires well-drained soil and full sun for best fruiting.

Roses are usually grown for their flowers, but the **hedgehog** or **rugosa rose** (*Rosa rugosa*, Zones 2–9, 9–1) is grown as much for its colorful fruit. This four-to eight-foot rounded shrub produces single, fragrant blossoms throughout the growing season; depending on the cultivar, flowers are white, pink, or purplish red. The "hips" that follow the blooms are red to red-orange and are eaten by bluebirds, brown thrashers, cardinals, cedar waxwings, song sparrows, goldfinches, juncos, mockingbirds, and robins.

Rita Pelczar is an associate editor of The American Gardener.

Garden Havens *for* Pollinators



Making your garden inviting to pollinating insects not only leads to more fruitful harvests but provides vital habitat for these garden helpers.

BY JO ANN ABELL

AT ONE TIME or another, we have all walked through a summer meadow and been amazed by the variety of wildflowers in bloom. We tend to romanticize such displays, but the truth is that the kaleidoscope of flower shapes, the spectrum of colors, and the bouquet of scents were not put here for our enjoyment; they serve a far more serious purpose—that of survival. The range of floral forms we see today has developed over millions of years in large part as a means of attracting and guiding insects searching for nectar and pollen. In the course of this food gathering, insects transport pollen from one flower to another, unwittingly taking part in a mutually beneficial relationship that is one of nature's greatest miracles.

Pollination is the first step in the reproduction of flowering plants. Before a plant can set fruit, pollen must first be trans-

ferred from the anther (male sexual parts) of one flower to the stigma (female sexual parts) of that flower—or sometimes of another flower—where the pollen “germinates” and fertilization takes place.

Over time, different mechanisms for pollination have evolved in flowering plants. Most plants (about 80 percent) have both male and female parts within each flower. While some of these “hermaphroditic” plants are self-fertilizing and don't require any outside assistance from pollinators, studies show that nearly all benefit from cross-fertilization with pollen from another plant.

Some plants, including many trees and grasses, are primarily wind pollinated. Their insignificant flowers produce large quantities of pollen to give the best chance of success—it is this wind-borne pollen that most plagues allergy sufferers. A few aquatic plants are pollinated by water.



Top: A monarch butterfly gathers nectar from the flowers of butterfly bushes at River Farm. **Above:** Bumble bees, such as this one feeding in a cactus flower, collect copious quantities of pollen in a uniquely designed area known as the “pollen basket” along the outside of their hind legs.

Did you know...?

- Wild pollinators, it is estimated, help produce up to one-third of the food we eat.
- Bees of all forms are responsible for approximately three-quarters of all pollination.
- Most bees are unlikely to sting.
- Non-honey bee pollinators are responsible for the pollination of around \$6 billion in crops each year.

But for most plants—especially vegetables, fruits, and ornamental flowers—pollination is achieved by thousands of insects, including bees, flies, wasps, butterflies, moths, beetles, and ants (see box, “Plants and Their Wild Pollinators,” page 38), with a helping hand from vertebrates such as birds, bats, and even rodents. By conservative estimates, some 100,000 to 300,000 species of pollinating insects exist worldwide, while in North America there are probably well over 10,000 active species.

These pollinators are critical to the growth of one-third of the foods we eat. Research has shown that food plants—even those that are self-fertilizing—bear earlier and larger harvests if they are visit-



Bees are responsible for most pollination, but a host of other insects, such as this snowy tree cricket, play important roles as well.

ed by lots of pollinators. These insects also play a major role in the development of fertile seeds, so gardeners who save seeds from year to year can be assured future crops. Just as important, the pollination activities of these myriad insects sustain the diversity of natural ecosystems and the other forms of wildlife that inhabit them.

POLLINATORS IN PERIL

The European honey bee (*Apis mellifera*), introduced to North America from Europe, is the best known and often most visible of our pollinators, but its numbers have been reduced over the last two decades because of disease. Behind the scenes, a host of lesser-known native insects have been carrying out a large portion of the pollination in near anonymity.

Notable among these wild pollinators are some 4,000 species of “solitary” bees, so called because they live and work alone rather than in cooperative colonies. Solitary bees are divided into various groups, including mason or orchard bees, sweat bees, leafcutter bees, mining bees, alkali bees, and carpenter bees. Experts estimate that these solitary bees are responsible for

some 60 percent of the total flower pollination in North America, and they are particularly valuable pollinators of fruits and vegetables.

In recent years, the diversity and populations of these native pollinators have declined dramatically, as chronicled in *The Forgotten Pollinators*, by Steve Buchmann and Gary Nabhan (see “Resources,” page 39). Fifty years of suburban sprawl, intensive agriculture, rangeland grazing, clear-cut logging, and mining have wiped out millions of acres of woodlands and meadows where wild pollinators live and forage.

Most pollinators require plants that flower sequentially to provide food sources throughout their life spans. Elimination of these sources by herbicide spraying or clearing of native vegetation literally starves the insects that rely on them. Buchmann and Nabhan’s book documented the plight of these endangered microfauna, which don’t captivate public opinion in the way that charismatic creatures such as elephants and whales do.

“The role of our native pollinators is even more critical given the disease problems facing honey bees,” says Scott Hoffman Black, executive director of The Xerces Society, a non-profit organization working to protect biodiversity through the conservation of North American invertebrates. By expanding public awareness about pollinators of all kinds, Black and his organization hope they can reverse the decline in pollinator diversity, particularly among native bees.



A small native green metallic bee gathers nectar in a centaurea flower.

One of the reasons pollinator diversity is so important is that not every insect can pollinate every flower. Over time, plants evolved distinct and intricate flower structures that favored specific pollinators, while at the same time, the insects that relied on these flowers for food became more specialized, undergoing changes to the structure and function of their collecting organs, their sensory faculties, and even their behavior.

To get the nectar and pollen they need to feed their young and fuel their flight—and in the process carry out the vital work of pollination—each insect must be able to find a specific type, or types, of flower at a certain time of year. As with most things in the natural world, the success of pollination relies heavily on the principle of biodiversity.

WHAT GARDENERS CAN DO

By simply incorporating a mixture of plants, gardeners can add diversity to any garden, even if the space is on a balcony or in a townhouse front yard. Plants come in all shapes and sizes, and each has something to offer different types of wildlife.

Additional diversity can be achieved by selecting plants suited to different soil types, moisture levels, and light exposures found in a typical landscape. Each addition increases habitat diversity and boosts the garden's ability to develop its own system of checks and balances and function more like a sustainable natural community.

But creating diversity doesn't mean reinventing your landscape. Adding a few low-growing plants in front of foundation shrubs or a hedge creates a new layer of vegetation and provides a protective environment for insect interactions. In the vegetable garden, mixing up the plants a bit, even alternating within the row, or adding flowers or herbs around the edge of a vegetable garden accomplishes a higher level of complexity. The small flowers of herbs such as thyme (*Thymus* spp.), rosemary (*Rosmarinus officinalis*), and lavender (*Lavandula* spp.) are attractive to many pollinators.

When selecting plants to add to your

garden, be sure to consider plants native to your region. Insects co-evolved with plants native to specific regions or habitats and will be more successful given the opportunity to visit some of these plants.

Many non-native plants are also suited to a wide variety of pollinators, but be aware that some of the newer cultivars have been bred for flower size and showiness at the expense of pollen or nectar production. Avoid planting too many double-flowered selections—these often have inaccessible or little nectar and pollen—and include a few heirloom varieties, which are less likely to have been tinkered with.

FLOWER SHAPES

To attract pollinators of all kinds, select plants that have a variety of flower shapes and sizes. If garden space is an issue, members of the composite (daisy) family are a good choice. Their flowers are composed of a circle of ray petals around a central cone of pollen-laden disk flowers suited to a broad range of pollinators, including butterflies. This family includes purple coneflower (*Echinacea purpurea*) and blanket flower (*Gaillardia* spp.).

Plants with deep, tubular blooms, like larkspur (*Delphinium* spp.) and toadflax (*Linaria* sp.), evolved to attract specific pollinators, such as skipper butterflies and other insects with long mouthparts. More robust bees, like the bumble bee, can get at the nectar by pushing their way between



Butterflies and moths, like this Satchem skipper, have long tongues specially adapted to gathering nectar from tubular flowers.

the petals of flowers such as penstemons and irises. Members of the carrot or parsley family, such as dill (*Anethum graveolens*) and angelica, make great nectar sources for small bees, flies, and wasps.

COLOR AND FRAGRANCE

Each pollinator species has definite preferences in flower color, size, fragrance, and shape. And with something as important as plant fertilization at stake, nature has seen to it that insects are able to locate their preferred flowers from afar. All nectar-producing flowers feature a colorful corona.

Watch a drone fly and you'll see it zero in on daisies and other flowers with yellow in them. Because drone flies are fuzzy, like bees, the pollen sticks to their bodies, where it is carried from flower to flower, aiding in the pollination of plants that are not self-fertilizing.

Bees and many of the pollinating fly species are unable to distinguish the color red. They see in a range shifted toward blues and the ultraviolet. Good flower choices for these insects are blue, purple, violet, white, and yellow. Humming-

birds, on the other hand, are particularly attracted to the color red in flowers and hummingbird feeders.

Many plants use scent to lure specific pollinators. One of the most unusual ex-



To cater to as many pollinators as possible, grow plants that have a wide variety of flower shapes and colors. This perennial border at River Farm offers a buffet that includes phlox, Joe-Pye weed, rudbeckias, and daylilies.

amples is the relationship between yuccas and the yucca moth. Yucca flowers release a strong scent in the evening, which attracts the night-flying moth. Moths lay their eggs in the ovary of the yucca flower, pollinating the flower in the process. When the moth larvae hatches, it feeds on part of the flower's ovary until it is mature enough to pupate. The remainder of the ovary produces fertile seeds that ensure yucca plants for future generations of moths.

Not all flower scents are as attractive to humans as they are to pollinators. Flowers of skunk cabbage (*Symplocarpus foetidus*), a native to swampy woodlands in the eastern United States, release a fetid scent in late winter, attracting pollinators such as flesh or carrion flies, which mistake the smell for the rotting flesh on which they feed.

AIM FOR SEASON-LONG BLOOMING

There are pollinators at work whenever plants are in bloom, which means from about March through November in temperate regions and year round in tropical or subtropical areas. Planting flowers that bloom in succession will provide a supply of nectar and pollen throughout the life spans of a diverse array of pollinators. Early-flowering plants such as sweet alyssum (*Lobularia maritima*), snowdrops (*Galanthus nivalis*), and heathers (*Calluna* spp.) cater to all kinds of hungry beneficials waking up from their long winter's nap. In fall, asters, sternbergias, and colchicums provide a final burst of energy for late season pollinators.

Many of the plants gardeners consider "weeds" attract and sustain diverse pollinators and can help extend the season for pollinating insects. The much maligned dandelion provides valuable early season nectar and pollen, so it's worth letting a few plants set flowers. And in most regions, Joe-Pye weed (*Eupatorium* spp.), goldenrod (*Solidago* spp.), and milkweed (*Asclepias speciosa*) are late summer and fall bloomers that attract dozens of pollinator species. These and many other wildflowers found along roadsides and in abandoned fields provide native bees and other pollinators with the energy they will need to make it through the long winter.

More cultured selections of some of these plants are now available (*Solidago*

PLANTS AND THEIR WILD POLLINATORS

Beetles	magnolias, sweetshrub (<i>Calycanthus</i> spp.), wintersweet (<i>Chimonanthus</i> spp.)
Bumble bees	lavender, foxgloves (<i>Digitalis</i> spp.), passionflowers (<i>Passiflora</i> spp.), catmints (<i>Nepeta</i> spp.), scarlet runner beans (<i>Phaseolus coccineus</i>).
Butterflies	asters, bee balms (<i>Monarda</i> spp.), coneflowers (<i>Echinacea</i> spp.), honeysuckles (<i>Lonicera</i> spp.), milkweeds (<i>Asclepias</i> spp.), penstemons (<i>Penstemon</i> spp.), yarrows (<i>Achillea</i> spp.).
Flies	cilantro, fennel (<i>Foeniculum</i> spp.), meadowsweet (<i>Filipendula ulmaria</i>), spurges (<i>Euphorbia</i> spp.), apples and crabapples (<i>Malus</i> spp.), primroses (<i>Primula</i> spp.).
Moths	jasmine tobacco (<i>Nicotiana glauca</i>), moonflowers (<i>Ipomoea alba</i>), yuccas
Solitary bees	milkweeds (<i>Asclepias</i> spp.), Joe-Pye weeds (<i>Eupatorium</i> spp.), globe thistles (<i>Echinops</i> spp.), mahonias (<i>Mahonia</i> spp.), ninebarks (<i>Physocarpus</i> spp.).

Note: This list of pollinators and examples of the plants they visit is not intended to be exhaustive or exclusive.

'Golden Fleece' and *Eupatorium* 'Gateway', for instance), but if such plants won't work with your design scheme, just set aside a small plot of ground in an inconspicuous corner and call it your "pollinator" or wild garden. Deadhead most of the plants before they go to seed to prevent them from spreading elsewhere.

AVOID USING PESTICIDES

If the goal is to attract beneficial insects and provide habitat for them in your garden, use

of pesticides is counterproductive. Most pesticides are not selective and will indiscriminately kill pests and beneficial insects. And research has shown that pest populations tend to bounce back faster after pesticide use than do those of beneficial insects.

Practicing integrated pest management is the best approach for a healthy, sustainable garden. Use low-tech methods of pest control whenever possible, such as washing aphids off plants with a strong jet of water or picking Japanese beetles by hand



Beetles like this flower beetle are often attracted to flowers primarily by scent.



A pollen-dusted green scarab beetle pollinates plants as it rambles from flower to flower.

and drowning them in a jar of soapy water. If you do have a serious pest problem, look for low-toxicity pesticides that are targeted to that specific pest, such as iron sulfate-based products used for slug control.

Remember that even low-toxicity or organic pesticides can harm beneficial insects as well as pests. For instance, bacterial insecticides such as *Bacillus thuringiensis* var. *kutarski* (Btk) are commonly used to control plant-munching caterpillars such as cabbage loopers, but these products can also kill the larvae of desirable butterflies. Whenever possible, try to apply pesticides only to the specific area where they are needed and at the correct stage of the targeted pest's life cycle.

PROVIDE NESTING SITES FOR POLLINATORS

To attract a diverse array of pollinators, you need to provide different kinds of nesting sites or habitats in your garden. According to Black of the Xerces Society, availability of nesting habitat may be the most important limiting factor for native bees. "You can put all the flowers you want in your garden," he says, "but if you don't have places for the bees to nest nearby, you may not have many bees." For instance, most native bees nest underground in well-drained, open, sunny areas. Simply clearing the vegetation from a three- by three-foot area and gently compacting the soil can provide suitable habitat; a gently mounded sand pile can also become a nesting site. Place a few rocks on the site to give these sun-worshippers a place to bask.

Other solitary bees nest in wood—usually dead branches or trees. To encourage wood-dwelling bees, you can purchase pre-made bee "condos" from virtually any

garden catalog or garden center, but these habitats are quite simple to make by drilling different-size holes in untreated scrap wood or logs (instructions for making these bee havens are available on the Xerces Society Web site—see "Resources," right).

After a night of inactivity, bees need warmth first thing to become active again. Place bee habitats where they will be sheltered from the weather, with entrance

holes facing east or southeast to catch the morning sun. Most bees forage within 100 to 200 yards of their nest, so try to site habitats within that distance of your vegetable garden, orchard, or flower border.

It's hard to overcome the notion that a garden containing any type of debris is unkempt or neglected. But by pruning and carting away all the organic debris, you are removing hiding places that provide summer shelter and overwintering sites for lady beetles, butterflies, praying mantises, and other beneficial insects. Leave patches of dead perennial stalks unpruned through the winter and place a few small piles of sticks or logs in discreet areas around your landscape. Don't rake up every fallen leaf in autumn. If you can't bear leaving dead plants in plain sight, then find an out-of-the-way place in the garden that you can leave au naturel at least until early spring.

EMBRACING DIVERSITY

Like all creatures of habit, we gardeners tend to fall into the trap of doing things the same way year after year. Gardening is an ever-learning process. Sometimes we all ought to take a step back and think about what we are doing. All it takes to build diversity into the landscape is a bit of planning, open mindedness, and creativity. Then just sit back and wait for your visitors. Not only will you have healthier, more vigorous plants and a better harvest, you'll have that deep-down satisfaction that comes from doing something that might just help out the natural world around you.

Jo Ann Abell writes and gardens from her home in Middletown, Maryland.

Resources

The Xerces Society, 4828 Southeast Hawthorne Boulevard, Portland, OR 97215. (503) 232-6639.
www.xerces.org.

■ *The Pollinator Conservation Handbook*, an illustrated, comprehensive guide to understanding, protecting and providing habitat for native pollinator insects.

National Wildlife Federation, 1400 16th Street, N.W., Washington, DC 20036. (202) 797-6800.
www.nwf.org/backyardwildlifehabitat.

■ Native plant guide and pollinator habitat projects.

USDA Carl Hayden Bee Research Center, 2000 E. Allen Road, Tucson, AZ 85719. (520) 670-6380.
<http://gears.tucson.ars.ag.gov>.

■ Online handbook focusing on food crop pollination.

Books

Insects and Gardens by Eric Grissell. Timber Press, Portland, Oregon, 2001.

The Forgotten Pollinators by Stephen L. Buchmann and Gary P. Nabhan. Island Press, Washington, D.C., 1996.

The Natural History of Pollination by Michael Protor, Peter Yeo, and Andrew Lack. Timber Press, Portland, Oregon, 1996.

"Pollinator-friendly Cut Flower Plants."

Developed by USDA Horticulturist Leslie Gilbert, this fact sheet is designed to help market gardeners and owners of small farms choose cut flowers that will attract pollinators and other beneficial insects. Available at www.smallfarmsuccess.info/poll_friendly.cfm or by mailing a request to Mark Davis, Sustainable Agricultural Systems Laboratory, ARS, USDA, Building 001, 10300 Baltimore Avenue, Beltsville, MD 20705.

Vintage Pears

With melt-in-your-mouth texture and delectable flavor, heirloom pears offer a taste experience not to be missed.

BY RITA PELCZAR



IF YOUR ACQUAINTANCE with pears is based upon the selection at the local supermarket, you've been missing one of life's great pleasures. Not that there's anything wrong with a nice ripe 'Bartlett' or a juicy 'Anjou', but when it comes to flavor, the three or four pear varieties that typically fill the grocery shelves barely scratch the surface of the taste sensations available in the world of pears.

The supermarket varieties share high marks for their storage, handling, and shipping properties, and consequently are available across the country, year round. There are other pear varieties that are abject losers when it comes to handling and shipping; they are so fragile and easily bruised, they must be individually harvested, delicately handled, and transported no further than the kitchen.

"Many pear varieties are either hard to grow commercially, don't ship well, are adapted to a small geographic region, or have a very narrow window of ripening—when the flavor excels—before quickly turning to mush," explains Chris Manning, editor of *Backyard Fruit Grower*, a newsletter for amateur fruit growing enthusiasts. But their flavor is well worth the effort for those who prize fruit quality over durability.

PEAR HISTORY

Pears have been cultivated for more than 4,000 years. They were cherished by ancient Greeks; the poet Homer refers to them in the *Odyssey* as "the gift of the gods." Romans imported this "exotic fruit" for their own gardens, selecting varieties for their dessert qualities. Through the Middle Ages and into the Renaissance, pears were nurtured and improved through breeding, largely in the monastic gardens of the Mediterranean region.

Most pears grown today in North America were derived from the European pear, *Pyrus communis*, a species indigenous to southern Europe and western Asia. *Pyrus pyrifolia* is the wild ancestor of the Asian pear, a crisp cousin to the European pear that in recent years has been gaining popularity with American consumers.

Most common European pear varieties have been around long enough to be considered heirlooms: 'Bartlett'—formerly known as 'William's Bon Chretien'—is an English variety that dates back to the 1700s; 'Bosc' (circa 1807), and 'Anjou' (1820), both hail from Belgium. 'Seckel' or sugar pear is an American variety of the European pear, a chance seedling discovered in Pennsylvania, introduced in the late 1700s (see "A Selection of Heirloom Pears," page 44).

Many high-quality pears were first grown in this country in the early 1800s by members of the Massachusetts Horticultural Society, who acquired selections from European horticulturists, including Jean-Baptist Van Mons, a Belgian physician and avid fruit breeder who was a particularly important source of these early varieties, according to Ethan Natelson, president of both the Southern Fruit Fellowship and North American Fruit Explorers (NAFEX). "He was the first to demonstrate that scions [bud wood used for grafting] could be transported over vast distances by sealing them in glass tubes packed with moist glass wool," explains Natelson. "Sadly, many if not most of these wonderful cultivars have been lost to time."

To stem the further loss of old cultivars, the U.S. Department of Agriculture's National Clonal Germplasm Repository (NCGR) in Corvallis, Oregon, maintains a gene bank of pears in its collection of temperate fruit, nut, and agronomic crops.

"We presently have about 1,600 pear clones in our collection," says pear curator Joseph Postman. "About half of these are edible cultivars and the other half represent rootstocks and wild pear species from around the world." Approximately 250 of the pear selections are more than 100 years old. In addition to collecting, cataloging, and preserving these species and cultivars, the NCGR shares their collection with researchers and historical gardens (see sidebar, "In Search of Lost Pears," page 43).

HOME-GROWN PEARS

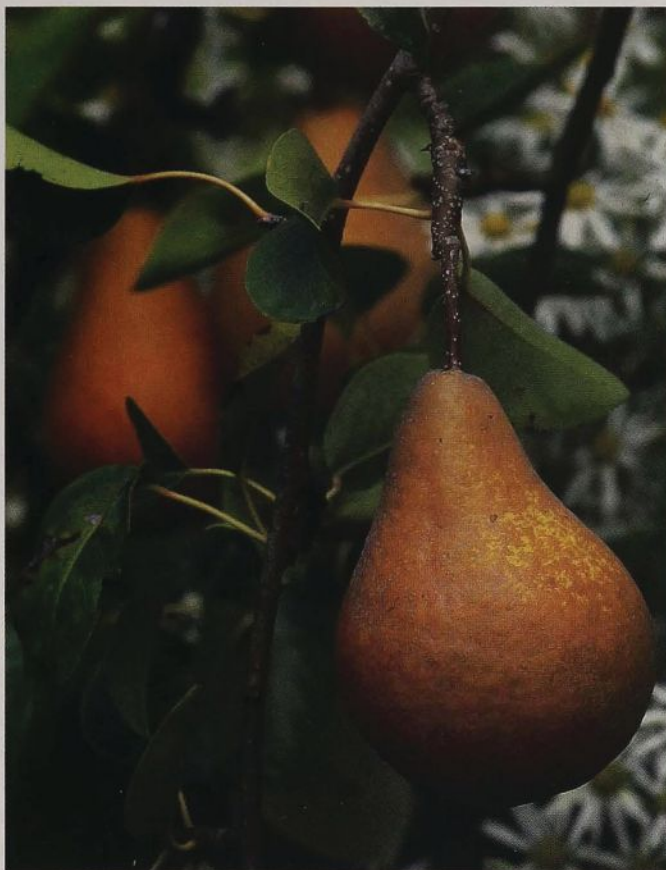
The variety of pears grown commercially may be limited by the exacting care and special handling that the delicate varieties with superior dessert qualities require, but no such constraints exist for backyard orchardists. If you are planning to grow just a few pear trees in your backyard, you can select the best varieties for your conditions and needs and give them individual attention. In addition to producing fruit, pear trees add interest to the landscape. "Pears have highly ornamental flowers, and the growth habit is amenable to espalier training," notes Manning.

If you are considering growing heirloom pears, Barbara Flores, author of *The Great Book of Pears*, suggests looking for fruit tastings in your area "so you can handle and taste the fruit" before choosing a variety to plant.

Nurseries that specialize in heirloom fruit (see "Sources," page 42) and local Extension services can provide information about the varieties best suited to your region, pollinator requirements, and the optimum time for planting—either in late fall or very early spring.

Another important characteristic to consider when selecting a variety is its chilling requirement—the amount of

cold necessary for the tree to thrive and produce a reliable crop. Varieties differ in the number of "chill hours" they require. "A chill hour is one hour between 32 and 45 degrees [Fahrenheit]...hours below freezing do not count," explains Natelson, who gardens in Houston, where 450 to 500 chill hours each winter is typical. "If I planted a 'Bosc' pear, which would like at least 1,000 chill hours, it would never flower in Houston and ultimately would die," says



Above: All-over russetting gives the firm-fleshed 'Bosc' pear its characteristic cinnamon-brown color. **Opposite:** Heirloom pears come in a variety of shapes, sizes, colors, and flavors.

Natelson. "Alternatively, if I planted a tree with a 100 chill hour requirement, it would flower in early February and often be nipped by a late freeze, lose its flowers, and also produce no fruit."

Growing pears is not difficult, given the right variety, and a sunny spot with deep, well drained soil. An open area with good air circulation will help prevent damage from late frosts. Stan-

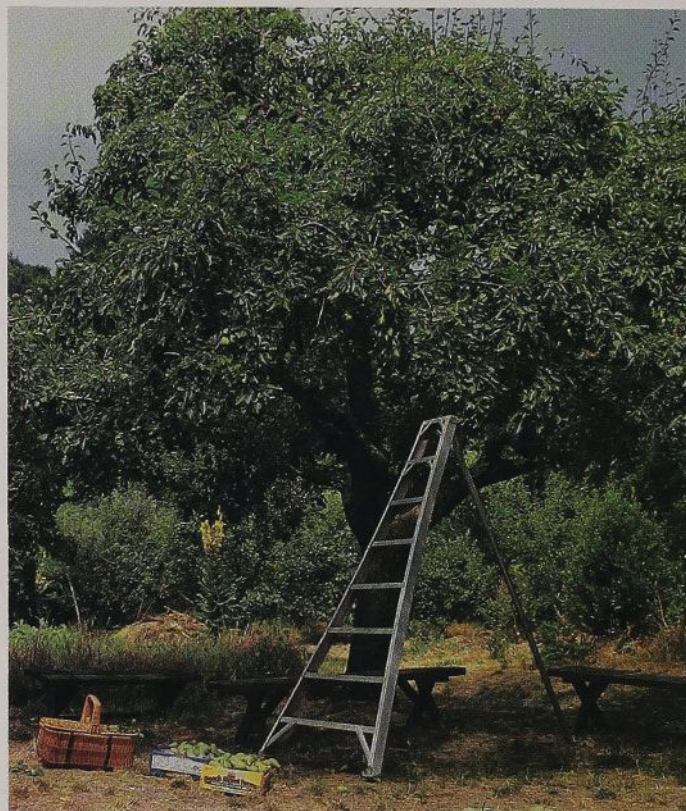
dard pears are usually grafted onto seedling rootstocks; trees may grow 45 feet tall and 25 feet wide over their lifespan. For smaller gardens, dwarf trees are available; these are created by grafting desired varieties onto quince rootstocks.

When growing a small number of pear trees, control of the pear's most serious disease, fireblight, is a relatively simple mat-

FIREBLIGHT!

Fireblight, a serious bacterial disease of pears, causes stems and branches to die from the tip, making the tree appear to have been scorched by fire. If left untreated, it can kill the tree. It was first observed in North America in the late 1700s, most likely introduced from Asia. By the mid-1800s it had wreaked its destruction on pear orchards throughout the East. The disease is not as serious in less humid areas of the West. This factor, along with other favorable environmental conditions for growth, fostered the commercial pear industry in the Northwest, where today, approximately 90 percent of our fresh winter pears are grown.

—R.P.



Most European pears are harvested slightly underripe and are allowed to finish ripening off the tree, often after a period of cold storage.

ter of limiting the application of nitrogen fertilizer and removing infected shoots whenever symptoms are detected (see "Fireblight!", top left).

ANTICIPATING THE HARVEST

According to Postman, knowing just when to harvest pears is something of an art. "If allowed to ripen on the tree, most pears will be rotten in the center by the time the outside is ripe."

While commercial growers determine the optimum time for harvest with a pressure tester that measures the firmness of the flesh, backyard orchardists use a variety of methods: Some look for a slight change in color; others cup the fruit in their hands and lift—if it separates from the stem, it's ready; others simply sample the ripening fruit until they are satisfied.

Harvest time for heirloom pears can turn into a family or neighborhood event. "Because they aren't commercial varieties—no extending the season year round with carbon dioxide storage or imports from South America—the harvesting of an heirloom variety becomes an anticipated celebration," says Flores. Each year, the Ecology Center in Occidental, California, the harvest of the 'Jargonelle' pear celebrates "with a different gourmet menu featuring the pears in every dish," says Flores.

Sources

Cummins Fruit Tree Nursery, Geneva, NY. (315) 789-7083. www.cumminsnursery.com. Catalog online only.

Henry Leuthardt Nurseries, Inc., East Moriches, NY. (631) 878-1387. www.henryleuthardtnurseries.com. Catalog free.

Southmeadow Fruit Gardens, Baroda, MI. (269) 422-2411. www.southmeadowfruitgardens.com. Catalog online.

Trees of Antiquity LLC, Paso Robles, CA. (805) 467-9909. www.treesofantiquity.com. Catalog free.

Resources

Backyard Fruit Growers, www.sas.upenn.edu/~dailey/byfg.html.

The Backyard Orchardist: A Complete Guide to Growing Fruit Trees in the Home Garden by Stella Otto. OttoGraphics, Maple City, Michigan, 1995.

The Great Book of Pears by Barbara Jeanne Flores. Ten Speed Press, Berkeley, California, 2000.

North American Fruit Explorers (NAFEX), www.nafex.org.

USDA/ARS National Clonal Germplasm Repository, 33447 Peoria Road, Corvallis, OR 97333. www.ars-grin.gov/cor.

IN SEARCH OF LOST PEARS

In finding and preserving heirloom pears, repositories such as the NCGR are often aided by amateur sleuths such as Mike Tomlinson, an avid antique fruit tree collector who recently rediscovered the 'Petre' pear, a variety grown by John and William Bartram in Philadelphia in the 1700s.

Tomlinson's curiosity about the 'Petre' (sometimes called 'Lady Petre') pear was piqued by a chance comment made by an associate at the Historic Bartram's Garden. His investigations eventually led him to an old tree in a backyard in Germantown, Pennsylvania, as well as to an offspring of that tree located in Chevy Chase, Maryland. As far as anyone knew, those were the last two 'Petre' pears in the world.

Grafts made from scions collected from the tree in Maryland were successful and Tomlinson now has about 35 young 'Petre' trees that are doing well. At least one of these will be donated to NCGR for safekeeping.

"There are individuals in California who are trying to resurrect and identify old pear trees still growing around the old Spanish Missions, such as those at La Purissima or at San Juan Bautista," says the NCGR's Postman. "We have propagated those trees and are growing them in our collection...perhaps

some day we will be able to identify them as ancient cultivars from Spain, or maybe they were planted as seedlings when the missions were established."

Three years ago, Cecil Compton, a retired Oregon State University professor who often helps to identify old pear trees, received some fruit and cuttings that he hoped might be 'Onondaga', a variety from upstate New York that was grown in the early 1800s but was thought to be extinct. This variety was known only from its description in U.P. Hedrick's *The Pears of*

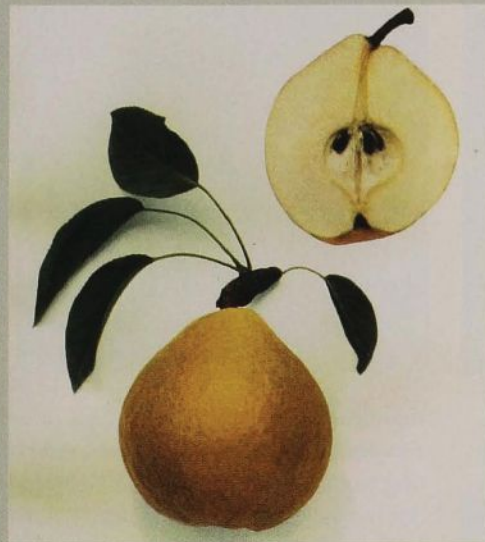


Illustration of 'Onondaga' from *The Pears of New York*, published in 1921.

New York, a 1921 classic regarded by some as the pear bible. "We now have this tree growing in our orchard," says Postman, "and in another year or two, when it produces fruit, we will compare it to old illustrations of 'Onondaga' and see if it indeed has been resurrected."

One factor that works in favor of pear collectors is that pear trees are often long-lived. In Danvers, Massachusetts, a small fenced area on the grounds of the Osram Sylvania lighting company encloses a gnarled pear tree that researchers believe was planted in 1632 by John Endicott, the first governor of Massachusetts. Although the Endicott Pear has suffered injuries from hurricanes and vandals, it has survived for more than 370 years and is still producing fruit. —R.P.

During the fruit tastings held at Trees of Antiquity, a nursery in Paso Robles, California, that specializes in heirloom fruit trees, owner Neil Collins has observed an interesting phenomenon: "Apples tend to dominate the table. But over at the end will be a few of our pears that are at their peak in ripeness. There is always a small gathering of folks off to the side in a glassy-eyed trance sliding slice after slice of pears into their mouths oblivious to the world beyond their lips."

Heirloom pears grown at Filoli, an historic estate and formal garden south of San Francisco, are stars of a fruit tasting held there each autumn (see "Regional Happenings," page 58). "The heirlooms are treated with such care—stood up in boxes to avoid bruising," says Flores. "When perfectly ripe, the aura of preciousness reminds me of the fine fruit served to Kings and the European aristocracy, who appreciated the delicacy."

Ephemeral Euphoria

But such delicacy comes with a price—in addition to the pampered care it requires, the fruit is available for a very brief time. "It's been my experience that the pear has one of the smallest windows revealing the essence of its flavor and texture," says Collins. "The pear requires patience and understanding."

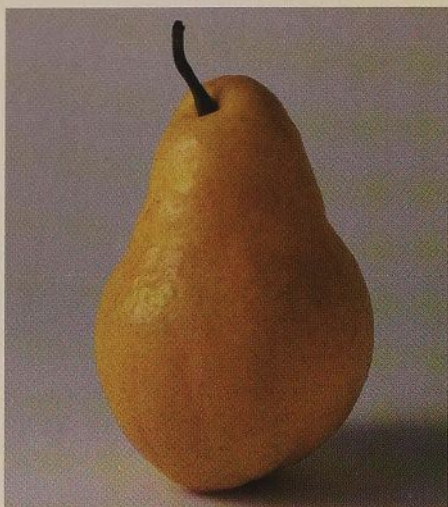
"After the October fruit tasting at Filoli, festival goers naturally want to know where they can buy these delicious pears they've never tasted before," says Flores. "The answer is one we're not used to hearing: 'You have to wait until next year.'"

Is it worth the wait? Absolutely. "Harvesting heirloom pears that can't be found in the supermarket offers more than a new taste," says Flores, "[it is] a rare gift." She compares one of her favorite heirlooms, the 'White Doyenne' with the familiar 'Bartlett': "The 'White Doyenne' is a small fruit—rich, buttery, like a fine Chardonnay, delicate to handle, more subtle winelike flavor. It's like comparing a fine wine, with all of its intricacies, to grape juice or Kool-Aid."

The most delicious pears are simply too delicate to withstand the rigors of commercial production. So the only way to experience the exquisite flavors and textures the lesser-known pears can offer is to attend a pear tasting or, better yet, to grow your own. Two or three carefully selected pear trees can provide an annual bounty of flavors that will linger in your memory throughout the year. And don't forget the adage "plant pears for your heirs;" long-lived pears can become a garden legacy for future generations. 🍐

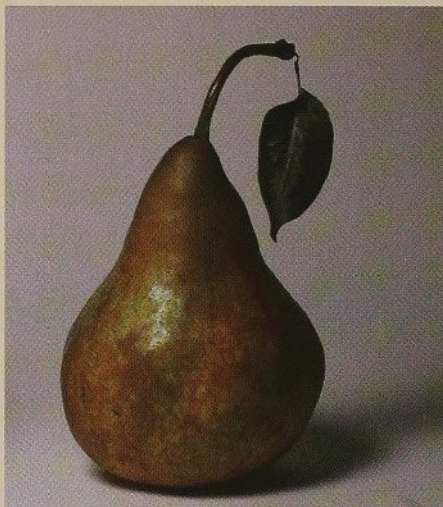
Rita Pelczar is an associate editor of *The American Gardener*.

A Selection of Heirloom Pears



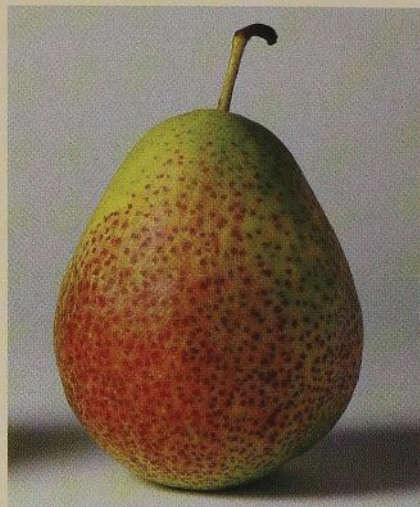
'Bartlett'
(formerly 'Williams' Bon Chretien')

This large, classic-shaped pear from England dates back to the early 1700s. Although harvested green in summer, its skin ripens to a pure yellow. Its creamy white flesh has a juicy, buttery texture and sweet, musky flavor. Its flavor is best after several weeks of cold storage.



'Bosc' ('Beurre Bosc')

A large, russet-skinned pear, 'Bosc' has a slightly fibrous texture, an extremely high sugar content, and a spicy flavor. This pear is very susceptible to fireblight.



'Forelle' (trout pear)

Forelle means trout in German, referring to the troutlike red speckles that dot the yellow skin of this pear. Eventually, the spots fade into an attractive crimson blush. The fruit is somewhat rounded, with smooth, white, richly flavored and aromatic flesh.



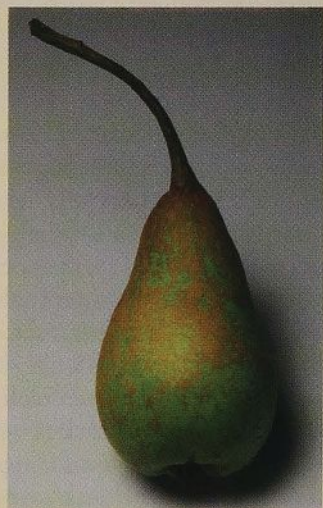
'Anjou' ('Beurre d'Anjou')

The fruit of the 'Anjou' is large and conical, with a short neck. Its skin is green, even when ripe. Considered an excellent storage pear, it can be kept in controlled-atmosphere storage for six months. Its flavor is lemony, and its texture is smooth, but it lacks the sweetness of many other cultivars.



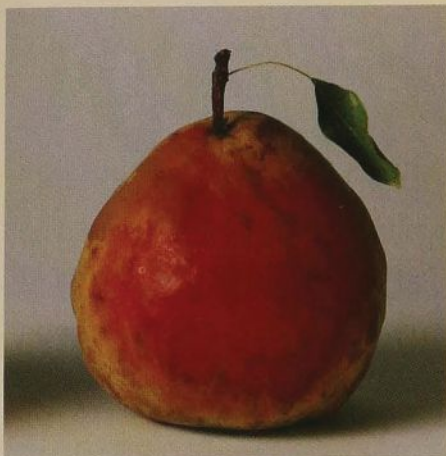
'Comice' ('Doyenné du Comice')

This pear originated in France in 1848 and has become a traditional Christmas gift fruit. It is large and greenish yellow when ripe. Its flesh is buttery, tender, aromatic, and very juicy. Because it is so susceptible to disease, it is usually grown in the West, where growing conditions are most favorable.



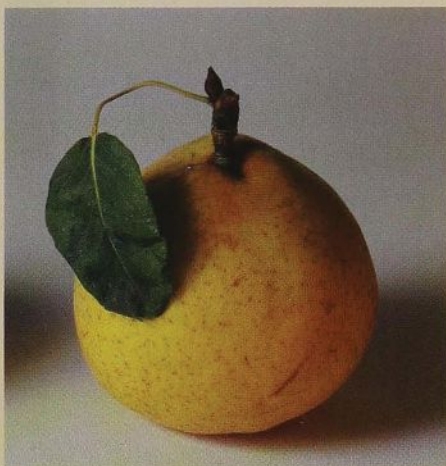
'Jargonelle'

The origin of this ancient variety is not known, but it was probably grown by the Romans, perhaps introduced from ancient Greece. The fruit ripens early in the season, and can be eaten fresh off the tree. It is green with light russetting, and its flavor is both sweet and tart. It does not last long after harvest.



'Flemish Beauty' ('Fondante de Bois')

This cultivar was discovered as a wild tree in a Belgian forest and introduced in 1830. Its original name means candy of the woods—a nod to its sugary sweetness. It has a rounded, uniform shape, and smooth, clear yellow skin with a reddish blush. Its flesh becomes mealy in storage, so it is best eaten soon after harvest.



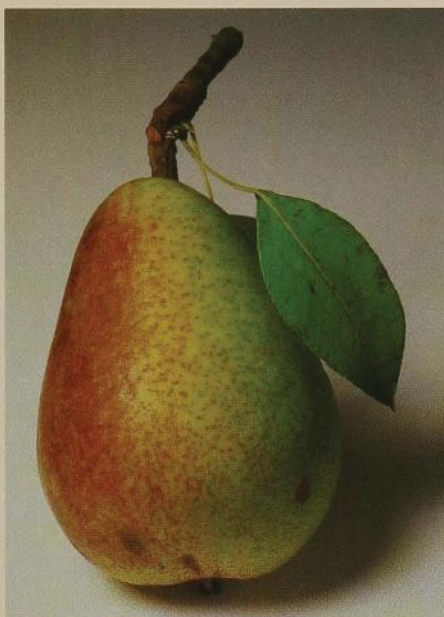
'White Doyenné'

This diminutive, rounded fruit with yellow, slightly russeted skin, hails from Italy, where it's been grown at least since 1550. It often displays a red blush where it has been exposed to the sun. Its flesh is juicy with a melt-in-your-mouth texture. The flavor is aromatic and complex: a blend of sweetness and acidity. Trees dependably produce heavy crops.



'Superfin' ('Beurré Superfin')

This French cultivar was discovered in 1838 and introduced to the United States in 1850. Considered by many to be one of the very finest of all dessert pears, its oval-shaped fruit is medium to large with greenish yellow, occasionally blushed skin. Its flesh is very juicy, fine textured, and never gritty, with a sweet, tart, and spicy flavor. It ripens mid-season and does not keep well.



'Clapp's Favorite'

An American introduction in the early 1800s, 'Clapp's Favorite' is an early summer pear that resembles 'Bartlett' in appearance. Best eaten fresh, it does not store well. It is sweet, not musky, with a crisp texture. A red mutation, 'Red Clapp's Favorite', is a good candidate for espalier.



'Seckel' (sugar pear)

This American cultivar, which was introduced in 1790, is frequently named as a favorite heirloom because it is easy to grow, delightfully sweet, and richly flavored. Although the reddish-brown, russeted fruit is small, trees consistently bear good crops, and they are tolerant of most pear diseases. The juicy, fine-textured, white-fleshed pears are prized both for eating fresh and for cooking.

Green Therapy

Three successful horticultural therapy programs in the Lone Star State illustrate the power of plants and gardening to help people with a wide range of physical, mental, and emotional needs.



STORY AND PHOTOGRAPHS BY CHRISTIE CRAIG

WE TEND TO THINK OF horticultural therapy as a relatively new concept, but its roots stretch back for centuries. In 1806, mental hospitals in Spain were touting the benefits of horticultural activities with their patients. A Scottish doctor in the 1800s was renowned for “curing” insanity by encouraging his patients to work on his farm. In America, Benjamin Rush, one of the original signers of the Declaration of Independence, was one of the earliest proponents of the idea that working in outdoor settings had therapeutic value for the mentally ill.

Today, the art and science of combining gardening skills with a mission to heal or comfort people with emotional or physical disabilities is being practiced at a wide variety of facilities around the country. With thousands of professionals and volunteers such as Master Gardeners trained to use horticulture as a therapeutic tool, new programs are popping up everywhere. Horticultural therapists are working in botanical gardens, schools, hospitals, rehabilitation centers, elder care facilities, prisons, and many other settings.

Horticultural therapy is being used to touch lives, to change lives, and to offer opportunities to those who otherwise might have few opportunities for creative activities with meaningful results. Among the hundreds of successful programs around the country are the following three, located in and around Houston, Texas.

Moody Gardens

There's no shortage of heart-stopping adventures available for visitors to Moody Gardens—a 140-acre complex in Galveston, on Texas's Gulf Coast—that includes a hotel, a convention center, and entertainment venues galore. Moody has an aquarium where penguins frolic on ice and a rainforest filled with thousands of tropical plants, exotic fish, and birds. There's also a discovery pyramid, where visitors can take a wild ride through the universe at the Ridefilm Theater, and a six-story 3-D IMAX theater.

But ask Terry O'Connell where the most thrilling experiences at Moody are taking place and she'll point you to a garden tucked away behind some greenhouses. “This is where the *real* miracles are happening,” says O'Connell, director of Moody's horticultural therapy programs.

The garden O'Connell is referring to is the Janet Jordan Enabling Garden. The garden is named after a former volunteer, whose generous legacy funded the development of a garden accessible to all. The 80-by-60-foot garden's construction began in the mid-1990s and was completed in 1997.

Moody's diverse horticulture programs reach out to seniors, the mentally and physically disabled, various scout organizations, and patients with brain injuries. Moody also has a vocational program that teaches life-skill classes to high

school students. “At Moody,” says O'Connell, “horticultural therapy is being used to enhance people's lives—physically, mentally, and emotionally.”

Anyone who has ever spent time planting or tending a plot of earth knows that gardening can be a very physical hobby. What most of us don't realize is that even relatively simple gardening



Above: Horticultural therapist Terry O'Connell teaches participants in one of Moody Gardens' youth programs about plant fragrance. **Opposite:** Brookwood Community residents Carrie, left, and Jenni, right, exult in the plants in their charge.



Above: Moody Gardens staff member Derrick Wells deadheads container-grown roses in Moody's wheelchair-accessible enabling garden. **Right:** A panoramic view of Moody Gardens in Galveston, Texas.

chores can be broken down into multiple steps that can be used to improve basic motor skills and enhance muscle coordination. "Just misting a plant with an atomizer helps strengthen muscle tone in stroke victims and people with spine or head injuries," says O'Connell.

A large poster-size photo hanging in the hallway of one of Moody's greenhouses commemorates one of O'Connell's favorite therapy memories. The picture is of a young man who was recovering from a brain injury. One cannot look at the photo without noting a palpable sense of pride radiating from his face. O'Connell explains, "After six months of intense struggling to roll up a hose in a donut, he was finally successful. To you and me, this is such a simple task; to him it was a remarkable accomplishment. He was so proud, and I was just as proud of him."

As with any garden tended with love, you feel the magic that lends itself to the emotional aspects of horticultural therapy. Upon entering the enabling garden, your senses are aroused. The sound of the water fountain sets a soothing tone, and the air is scented with a rich blend of rosemary, lavender, and roses. Visually you're treated to a variety of textures and colors from plants

such as blue plumbago (*Plumbago auriculata*), Rangoon creeper (*Quisqualis indica*), and snapdragons in assorted shades. On a beautiful arbor, cascading skyflower vine (*Thunbergia alata*) offers shade from the summer sun, and a picnic table sits nearby for those who wish to sit and soak up the ambience.

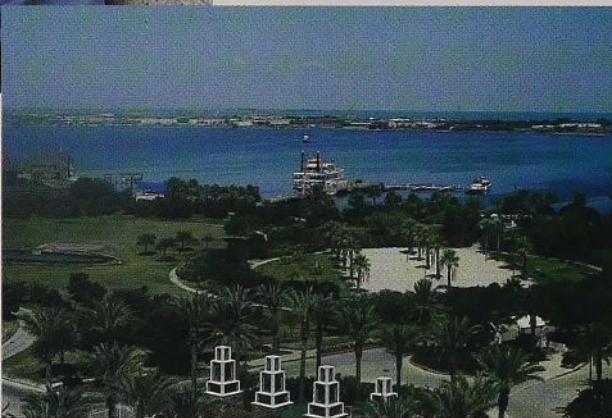
"A lot of rehabilitation takes place in very sterile environments," says O'Connell. "There's nothing sterile about a garden; it engages all of your senses. And there is something about caring for something that is alive, about watching it grow, that is spiritually rewarding."

The entire garden is evenly paved to allow for wheelchair accessibility. With raised planters three feet high, gardeners can care for the plants with very little bending or stooping. Hanging baskets and bird feeders are connected to pull strings that allow them to be easily lowered into someone's lap for maintenance. Other specialized adaptations of the garden are vertical planters that can be reached from a wheelchair. "The enabling garden was designed by and for people who, for one reason or the other, can't get on the ground and cultivate the earth," says O'Connell. "Each aspect of the layout was designed to be accessible to virtually anyone."

When visiting this amazing sanctuary, you're likely to run into employee Derrick Wells, who is wheelchair bound. "There are all sorts of things that disabled people or people with back problems can do that they never thought they could do," says Wells, who started out at Moody as a volunteer. From his wheelchair, Wells deadheads and waters the plants and feeds the fish in ponds throughout the complex.

"I've been here for nine years," he says, "and I can't begin to tell you the pride I feel when I see visitors stop and admire the beauty of the gardens that I helped create."

As evidenced by Wells' example, horticultural therapy can open up new career possibilities. Programs that focus on job skills can be found in



prisons and rehabilitation centers across the nation. At Moody, the program teaches gardening skills to people with disabilities or special needs. "We teach the ABC's of growing plants," says Bonnie K. Hays, another of Moody's horticultural therapists. "In the process, participants also become physically stronger and work on their social skills. It's great for self-expression and self-confidence. You see smiles on the faces of people who look as if they haven't smiled in a long time." Add all that up and you have a harvest any gardener would be happy to reap.

The Brookwood Community

Another exemplary horticultural therapy program is in action at The Brookwood Community, a 475-acre non-profit community for functionally disabled adults located just west of Houston. More than just a residential living area for its 100 res-

idents, Brookwood is a multipurpose enterprise zone that includes a café, craft store, plant production facilities, and a retail garden center. It is in this work setting that these often ignored and overlooked individuals are given a chance to contribute to society and become more self-reliant.

Brookwood's on-site horticultural program consists of 39 greenhouses and a large planting and propagation facility that supplies plants to four retail garden centers, three of which are located elsewhere in the greater Houston area. "The horticulture department produces a wide and continuously growing selection of plants, including annual bedding plants, flowering pot plants, perennials, hanging baskets, tropicals, vines, and herbs," says Jim Ging, Brookwood's assistant director.

Utilizing a step-by-step method, Brookwood's staff members teach residents—who are referred to as "citizens"—to do simple horticultural tasks in the company's greenhouses. By working as a team, these challenged adults have helped Brookwood accomplish something that most businesses can only aspire to: Over the past 10 years, sales of Brookwood's ornamental plants have increased more than 370 percent.

While this level of success has now made Brookwood largely self-supporting, the organization was founded and operated for many years through the assistance of generous individual and corporate donations.

"We're more about people than we are plants," says Ging. His words ring true as you walk through these greenhouses and see the residents at work. The pride in their eyes and smiles on their faces are sure signs that working with plants is good for the soul.

In one greenhouse, a woman fills pots with potting soil. Another resident places stickers on the pots. Small jobs, small tasks, but all of them completed with pride and a sense of accomplishment. "Not everyone can plant, and not everyone can stock, but by breaking down the jobs to small tasks, everyone can contribute," says Tim Hubbard, lead teacher in Brookwood's Horticulture Department.

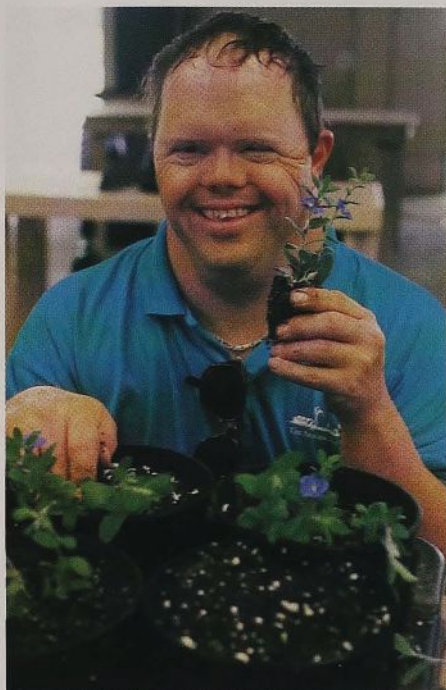


Located west of Houston, the landscaped grounds of Brookwood Community include living quarters for functionally disabled adults.

"Working with something that is alive and grows is simply an added benefit," Hubbard adds. "The residents see the efforts of their labor become flourishing plants, and then they see the people trailing through the greenhouses with their carts loaded with plants to buy and to take home. They know they had a part in making something of value."

The success stories of Brookwood are numerous, but two in particular stand out for staff members and volunteers. During an annual Appreciation Day Ceremony in Brookwood's Horticulture Center, residents wearing proud smiles were called, one by one, to receive formal certificates of appreciation, customized to honor each resident's unique contributions.

"To the best-dressed plant propagation expert," the announcer called. For one withdrawn resident, whom staffers described as "a child in an adult body," it was an unforgettable moment. When her name was called—possibly to receive the first award



Brookwood residents work with the facility's horticulture department in all phases of gardening activity. John, left, plants containers, while Kim, above, helps maintain the hundreds of plants in the greenhouse that are destined for retail sale.

Resources

American Horticultural Therapy Association, 909 York Street, Denver, CO 80206. (800) 634-1603. www.ahta.org.

Canadian Horticultural Therapy Association, 80 Westmount Road, Guelph, ON N1H5H8. (519) 822-9842. www.chta.ca.

The Brookwood Community, 1752 FM 1489, Brookshire, TX 77423. (281) 375-2100. www.brookwoodcommunity.org.

Mariner Health, 17600 Cali Drive, Spring, TX 77090. (281) 440-9000.

Moody Gardens, One Hope Boulevard, Galveston, TX 77554. (800) 582-4673. www.moodygardens.org.

in her life—she, quite literally, danced up to the front of the room. Brookwood's staff was moved to tears.

Another resident, who suffers from a disease that precludes most social interaction, was surprised when his name was called to receive an award titled, "To our most dedicated plant stocker." This usually withdrawn resident started to walk up, then suddenly ran the rest of the way to the announcer and hugged him. "It was probably the first hug he had ever given," says a staff member who was at the ceremony.

Mariner Health

At Mariner Health, an eldercare center in Spring, Texas, Activity Director Carrie Bretzke offers horticultural therapy to any interested residents. According to Bretzke, gardening holds many benefits to seniors. "Physically, gardening is really good for dexterity," she says. "With age it sometimes becomes more difficult to move our hands and other limbs. It is often easy for the elderly to simply stop using their muscles. By finding an activity that the residents like and enjoy, I can keep them moving, and they are healthier for it."

However, physical benefits are only one of the many advantages horticultural therapy brings to the elderly. "The elderly are known to lose confidence in themselves," Bretzke explains. "Because gardening can be adapted to meet everyone's abilities, it is a good way to give them a sense of accomplishment." And retaining self-confidence and self-worth is very important to seniors. "I've been gardening for as long as I can remember," says one resident as she pushed a shovel into the soft earth. "And I'm almost 100, so that's a long time."

One of Bretzke's success stories involves a woman who she describes as almost completely closed off from the world. "Nothing I did seemed to reach her," says Bretzke. "Then one day I took her outside to a raised bed and handed her a plant and shovel. It was as if a light came on. She immediately started digging and planting. From then on, she was a happier person, and gardening became part of her regular program."

"I think the best thing that comes from gardening is the reminiscing," says Bretzke. "Many of the residents here suffer from some degree of dementia, making it hard to recall memories that they would otherwise treasure. When an elderly person gets their hands in dirt and smells the earth and the plants, the sense of touch and smell helps them to recall past gardening experiences. And for anyone who loves horticulture, there are seldom any bad gardening memories."



Carrie Bretzke, activity director of Mariner Health in Spring, Texas, left, chats with Chu, one of Mariner's senior residents, while planting a raised bed. In addition to providing physical benefits, Bretzke finds gardening often brings back many happy memories for the elderly.

Another benefit to gardening, says Bretzke, is that it often stimulates conversation. "Socialization is definitely part of the horticultural therapy," she says. Then Bretzke ponders a minute and adds. "But you know, gardening is also a hobby that speaks its own language. We have many residents who do not speak English, and yet you get one of them together with another gardener and somehow they communicate. One will take the shovel. Another will point to a spot. They will dig, plant, and before long they're smiling. And that," says Bretzke, "is a good thing." 🌱

A free-lance writer and photographer, Christie Craig lives in Spring, Texas.

Hope for One of America's Rarest Plants

by Elizabeth Garcia-Dominguez

VISITORS TO Hawaii often take home enduring memories of the bright blooms of the native yellow hibiscus (*Hibiscus brackenridgei*), the island state's official flower. Such is the precarious nature of Hawaiian flora, however, that even this popular and exuberant plant is on the U.S. Fish and Wildlife Service's list of federally endangered plants. Hawaii leads the nation in endangered and threatened plant

species, but perhaps none is closer to the edge than Hawaiian tree cotton (*Kokia cookei*), which may well be the world's rarest plant.

A member of the mallow family, Hawaiian tree cotton is a small deciduous tree that sports showy, satiny red blossoms and broad, glossy leaves. Historically, it grew in the dryland forest of the western side of the island of Molokai. Like many endemic Hawaiian plants, this vulnerable tree was probably pushed toward extinction by the decline of the dry forest habitat. After the arrival of Polynesian peoples to the islands about 400 A.D., followed by Europeans in the late 1700s, forests were decimated by a flood of introduced barnyard animals and agricultural crops.

Development has exacerbated the problem in recent years, and today more than 90 percent of the original dry tropical forest has disappeared. Along with the forest vanished a host of native nectar-feeding birds, which researchers believe were key pollinators for Hawaiian tree cotton and other endemic plants.

TEETERING ON THE BRINK

At the time Hawaiian tree cotton was first classified by botanists, in the 1860s, only three individual plants were found. Extirpated from the wild in 1918, only one cultivated Hawaiian tree cotton survived by 1934. More than 130 seedlings from that tree were planted on the islands during the next 20 years, but none sur-



The rare Hawaiian tree cotton (*Kokia cookei*).

vived. With the death of the single cultivated tree in the late 1950s, the species was initially thought to be extinct. Then, in 1970, one surviving seedling of the cultivated tree was discovered, only to be destroyed by fire eight years later.

But the tree, phoenixlike, may rise from the ashes. With the support of the Center for Plant Conservation, a national network dedicated to recovering America's vanishing plants, botanists at two Hawaiian botanical institutions are collaborating to save the vulnerable plant.

INGENUITY TO THE RESCUE

When it proved impossible to root cuttings taken from the last survivor before the fire, scientists at Waimea Arboretum (now the Waimea Valley Audubon Center) grafted the cuttings onto rootstalks of a closely related plant. These grafted

cuttings have been used successfully to cultivate cloned plants.

None of these plants, which are all derived from a single parent, produce viable seeds. So micropropagationist Nellie Sugii of Honolulu's Lyon Arboretum has turned to tissue culture techniques to produce seedlings from immature embryos. "Because of inbreeding, the grafted plants are compromised, so they abort the seeds before they are fully mature in most cases," Sugii explains. "We take the fruit when it's almost mature, open it up, sterilize the seeds and fruit, and excise the embryo. Then we grow them on artificial growth media in test-tubes."

Sugii's horticultural wizardry has coaxed several seedlings to life; these precious new plants are cloistered in the greenhouse under close supervision.

Meanwhile, the other plants cultivated through grafting will be planted on 254 acres of protected land in Hawaii as part of an experimental restoration project in partnership with the U.S. Geological Survey.

Will tourists someday come across frilly, flamboyant Hawaiian tree cotton flowers blooming in Hawaii's remaining natural areas? The answer is still uncertain, but CPC botanists believe there's reason for hope.

Elizabeth Garcia-Dominguez is the communications coordinator for the Center for Plant Conservation.

The American Horticultural Society and the Center for Plant Conservation (CPC) are working together in support of plant conservation. As part of this partnership, AHS members can join the CPC at a discounted rate of \$25. To take advantage of this offer, contact CPC at (314) 577-9450 or visit the organization's Web site at www.centerforplantconservation.org.

SMARTGARDEN™ — Extending the Growing Season

There are many techniques for protecting plants from the first cold snap.

As the growing season wanes, gardeners often look for ways to delay demise of their annual vegetables and flowers. We all know that their fate is inevitable, yet the appeal of a few extra weeks of colorful blooms or fresh-picked produce inspires us to seek ways to thwart the cold—at least for a little while.

Because the first autumn frost is often followed by several weeks of mild weather, the protection provided to plants for a single night or two may extend the growing season significantly. By understanding what happens to plants when temperatures drop, we can better provide that season-lengthening care that may just result in fresh vegetables for the Thanksgiving table.

THE PHYSIOLOGY OF FROST DAMAGE

Plants have optimum growing temperatures at which they thrive, as well as limiting temperatures—both high and low—beyond which they cannot survive. Fortunately, these temperature ranges are not the same for all plants—so some species thrive in a tropical rainforest, while others inhabit the Arctic tundra.

As temperatures drop below freezing, the response in many plants is that the water between plant cells begins to freeze, forming crystals of ice. This causes the concentration of dissolved material in the intercellular solution to rise. In an effort to balance the solution, water from inside cells begins to diffuse out of the cell. If the freezing temperatures don't linger long, and rise gradually so that the ice melts slowly, water returns to the cells and little or no damage may result.

If the cold is extreme, however, or if it lasts a long time, cells may lose sufficient water to dehydrate and die. Or ice may form within the cell. This can cause the cell walls to rupture, again killing them. If the change in temperature is too rapid, cell walls may rupture as water diffuses out of, or back into the cell.

Critical factors influencing the occurrence and severity of cold damage to plants are: a) the tolerance to cold of the individual plant, b) the low temperature experienced, and c) the rate of the temperature change. Apart from select-

ing cold-tolerant species or varieties—a significant consideration—there is nothing the gardener can do about the first factor. But the second and third afford the gardener a few options to improve the chances of late-season harvests.

DELAYING THE DROP

One way to delay low temperature damage is to select planting locations carefully; microclimates can extend or cut short the growing season by weeks. Because cold air is heavier than warm air, it sinks to the lowest part of the landscape, which is where cold damage will usually occur first. Avoid putting plants that tend to have little tolerance for frost in such locations. On the other hand, walls and buildings that absorb heat offer a buffer to nearby plants from plummeting temperatures. If you garden in containers, you can often avoid damage to your plants by moving them to a protected location when frost is predicted. (For more on microclimates, see the SMARTGARDEN™ article in the July/August 2002 issue of *The American Gardener*.)

Another delay tactic involves trapping the Earth's heat with some kind of barrier. During the day, the sun's radiant energy is captured by the soil as heat, but when the sun goes down, that heat escapes. By placing a garden blanket, floating row cover, or a layer of bubble wrap over a row of tomatoes or a bed of annual flowers, some of the escaping heat is trapped, holding the temperature of the covered plants above freezing. Lighter covers can be spread directly over plants, heavier coverings can be supported by wire hoops. Sheets and light blankets—even loosely piled leaves—will do the job as well. If the cover is opaque, however, it should be lifted in the morning

when the sun returns, so that more warmth can be absorbed by the soil.

A variety of products such as glass cloches, plastic plant sleeves, tubes, and teepees can be used to reduce heat loss around individual plants. Some are designed to be filled with water, which serves as a mini-solar heat collector. The sun-warmed water helps retain the day's warmth around the plant. Both the individual sleeves and the garden blankets



Straw mulch and an umbrella-style cloche protect tender plants from the damaging effects of autumn's first cold nights.

MICHAEL S. THOMPSON

can also be used in spring to avoid late frost damage. And in addition to retaining warmth as cold weather approaches, both also help moderate temperature fluctuations.

MODERATING THE CHANGE

A rapid drop in temperature is generally far more damaging than a gradual drop. Many plants can adjust to a cold night if given time. Equally important, a fast rise in temperature can devastate plant cells trying to reabsorb water from those intercellular spaces.

Bark splitting on south facing fruit trees is an example of damage that occurs from rapid temperature fluctuations. The dark bark absorbs heat on a sunny day, causing the temperature to rise significantly higher than the ambient air temperature—just feel the bark on the south side of a tree on a sunny day in January.

When the sun goes down, the temperature drops fast, and the result is often a fissure in the bark. Whitewashing the south side of fruit tree trunks is a long-practiced damage avoidance technique—the white reflects rather than absorbs the heat, greatly reducing the rapid plunge in temperature from day to night.

Mulching helps reduce root damage to perennials and woody plants by moderating temperature fluctuations in the soil. A blanket of snow will do the same thing. The effectiveness of mulch increases when the soil is moist, because water changes temperature more slowly than air.

Watering plants—including their foliage—in the evening can increase the humidity immediately around the plant and reduce the probability of frost damage. It is important to water your garden thoroughly in the fall if rainfall is insufficient. The moisture helps buffer soil temperatures through the winter.

Winter watering is particularly critical for evergreen trees and shrubs. Because these plants never go completely dormant, they continue to lose water through their leaves, especially on sunny, windy days. If the water taken up by roots is insufficient to replace that lost by leaves, winter burn or scorch often results—leaves and needles turn brown or black along their margin or over the entire surface.

Evergreens planted in late summer or fall are particularly at risk for winter burn because their root systems may not become fully established before winter. In such cases, application of antidessicants may reduce the chances of damage. When sprayed on foliage, antidessicants (also called antitranspirants) form a thin, waxy film over the leaf surface, reducing moisture loss through stomata, the microscopic openings in leaves. Antidessicants can be applied in late fall, and reapplied in mid-winter, but only when temperatures are above freezing.

Rita Pelczar, Associate Editor

A selection of products for protecting plants in the garden in winter are profiled in "Seasonal Garden Goods" on page 54.

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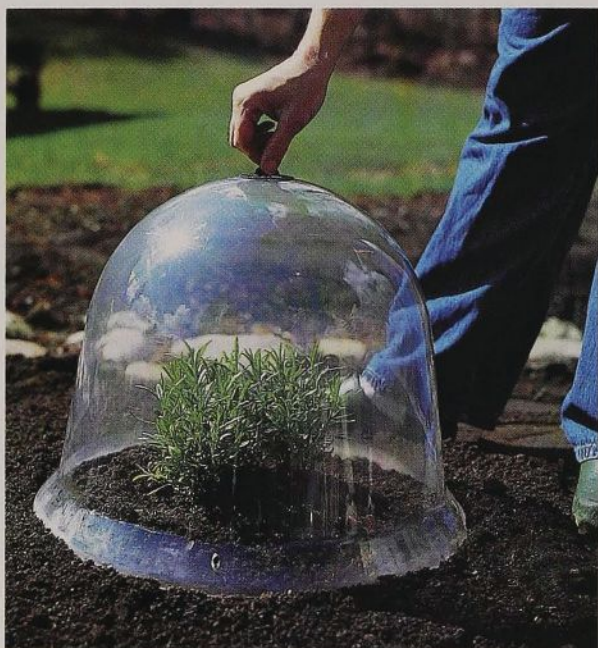
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SEASONAL GARDEN GOODS

As winter approaches, dropping temperatures and harsh winds can wreak havoc on your garden. Here are some products that will help protect your plants from severe weather damage.



The **Extra-Large Bell Cloche** is an updated version of an old-fashioned garden favorite. The impact-resistant cloche has 1/8-inch thick walls, 14 inches of headroom, and features top vents to reduce the chances of plants overheating on sunny days. Sells for \$24.99. Gardener's Supply Company. (800) 427-3363. www.gardeners.com.

Keep your borderline-hardy shrubs safe from sudden cold snaps with the **Bush Jacket**. Made of non-woven, durable, and breathable fabric, it is easy to install, clean, and reuse. A 5-by-7-foot jacket for individual shrubs retails for \$10; a 5-by-12-foot jacket for hedges for \$18.95. Circlemoon Products. (920) 684-0227. www.bushjacket.com.



Reduce windburn and wilting with **Wilt-Pruf Plant Protector**. Wilt-Pruf's anti-transpirant and protectant formula coats leaves and stems, trapping essential moisture. It dries as a clear, glossy film that does not interfere with plant growth. The naturally derived, non-toxic spray is available in various sizes, from a one-quart spray bottle for \$8.95, to a one-gallon jug for \$49.95. Available at many retail garden centers and mail-order suppliers. (800) 972-0726. www.wiltpruf.com.



Less-hardy plants can grow through the winter with the **Insulated Cold Frame**. This frame both insulates plants to keep them warm and filters out sunlight to prevent scorching. Hinged top panels allow for ventilation. A 41-by-23-inch unit is available for \$99.95; a 41-by-46-inch **Double Cold Frame** available for \$149.95 from Charley's Greenhouse & Garden. (800) 322-4707. 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.

Recommendations for Your Gardening Library

The New Book of Salvias: Sages For Every Garden.

Betsy Clebsch, illustrations by Carol D. Barner. Timber Press, Portland, Oregon, 2003. 344 pages, Publisher's price, hardcover: \$29.95.

IN *The New Book of Salvias*, Betsy Clebsch, a noted amateur botanist and horticulturist who gardens in northern California, displays once again her experience with and extensive knowledge of this useful and diverse genus. Color photographs and line drawings illustrate detailed descriptions of approximately 150 beautiful, garden-worthy species and significant hybrids.



An update of her *A Book of Salvias*, this volume includes information about more than 50 new salvia selections that she has evaluated since the first edition was published in 1997.

The author's expertise in growing salvias shines through in the advice given on design, planting, pruning, and propagation. Statements begun with "In my garden..." and "I have found..." not only lend credibility but also impart a friendly tone, as if Clebsch

and I had bumped into each other at the garden center and she was giving me advice on a prospective purchase.

Clebsch's species descriptions satisfy my curiosity about the plant's origins—geographic location, habitat, and elevation range—as well as the meaning behind the botanical name. Tidbits on discovery and historical usage also appeal to my desire to know more than just the physical characteristics of a given plant and its culture.

Many readers will find themselves immersed in the book, drawn from one finely crafted description to the next. Shortcuts are also available for gleaning information quickly, including lists of salvias suited for various uses and conditions—such as "Salvias for Containers," "Salvias with Especially Handsome Foliage," "Salvias for a Hot and Humid Climate," and "Water-wise Salvias."

Finding a public garden in which to view fine collections of salvias first-hand is facilitated by "Where to See Salvias," and perhaps the most satisfying list is "Where to Buy Salvias," particularly for gardeners who have become enamored with one or many species thanks to Clebsch's rich descriptions.

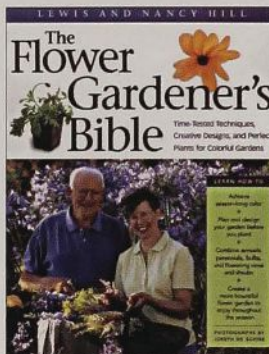
—Judy Mielke

Landscape architect Judy Mielke of Phoenix, Arizona, is author of Native Plants For Southwestern Landscapes and has taught courses on landscape plants and Arizona native plants at Arizona State University's College of Architecture and Environmental Design.

The Flower Gardener's Bible: Time-Tested Techniques, Creative Designs, and Perfect Plants for Colorful Gardens.

Lewis and Nancy Hill, photographs by Joseph de Sciose, illustrations by Elayne Sears. Storey Books, North Adams, Massachusetts, 2002. 352 pages. Publisher's price, softcover: \$27.50.

SO THE dynamic duo has done it again. Lewis and Nancy Hill, the Vermont couple who are nurseryowners as well as home gardeners, have co-authored their fifth book. Once more they have given readers a book overflowing with sage advice and solid information. Best of all, they have again created a work that is fun to read, easy to understand, and so exhaustive it seems a veritable mini-encyclopedia.



The book begins with an extended introduction to gardening in general and flower gardening in particular that should appeal to both advanced and novice gardeners. There's always something to learn from such knowledgeable folk, and

in this first of the three sections in which the book is organized, advice ranges from a discourse on design and site considerations, to a primer of garden terms, and an introduction to pests and diseases. All the basics, including a sampling of propagation techniques, are presented in the Hills' clear, user-friendly style.

The second section is a presentation of nearly two dozen variously themed flower gardens illustrated with drawings and photographs. Included for each garden is a short list of plants suited for areas with specific environmental conditions, such as shady corners, water gardens, and hillsides. Specialty sites—wildflower, rose, rock, and herb gardens—are also covered.

The third and largest section of the book is an illustrated plant dictionary. Titled "A Feast of Flowers," this section provides an alphabetical listing of dozens of plants, each with a summary of the vital statistics of bloom time, good companions, and hardiness zone. Included, too, is information on preferred species and cultivars, along with tips for best growing.

Between *Abelia*, a summer-blooming shrub, and *Zantedeschia*, an exotic bulb better known as calla lily, a wide selection of familiar and not-so-familiar candidates are covered, which, as the subtitle aptly suggests, are indeed the perfect plants for colorful gardens.

—Linda Yang

Linda Yang is author of four garden books, and contributor to the recently published New York Times 1000 Gardening Questions & Answers (Workman, 2003).

The Encyclopedia of Planting Combinations.

Tony Lord, photographs by Andrew Lawson. Firefly Books, Buffalo, New York, 2002. 416 pages. Publisher's price, hardcover: \$59.95.

IN HIS introduction, author Tony Lord offers a bit of a disclaimer about how to use this book, noting that it should not be viewed as a series of recipes for perfect plantings, but rather as a menu of creative suggestions for the reader to choose, revise, reject, or augment.

He also recommends using the book in conjunction with a plant encyclopedia so that a reader can evaluate the combinations with reference to cultural requirements, propagation information, and a greater range of varietal choices.

From my own perspective, I would add that American gardeners may be hard pressed to find and successfully grow some of the plants listed in this British-based reference, but if readers approach the book with these caveats in mind, I believe it can serve as a valuable resource for design ideas.

After a brief but constructive discussion of the art of combining plants, the bulk of the book focuses on planting combinations divided among shrubs and small trees, climbers, roses, perennials, bulbs, and annuals. More than 4,000 photographs are included, and an index permits readers to look for combinations containing specific plants.

Overall I found the plant combination suggestions to be very useful, especially those that highlight textural interplay. Some good examples are the reddish-purple leaves of 'Royal Purple' smoke bush intertwined with the mauve-pink flowers and chartreuse foliage of 'Claridge Druce' geranium; easy-

to-grow rugosa rose with 'Sioux' miscanthus and 'Herbstsonne' rudbeckia; and the bright dainty flowers of snowdrops draped over the bold colored leaves of *Bergenia cordifolia* 'Purpurea' in early spring.

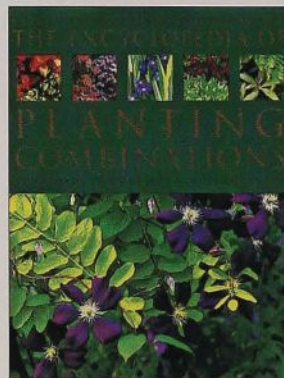
Andrew Lawson's photographs are evocative, but as with any printed images, they don't always convey the real essence of a particular color combination. In browsing through the images, I was reminded of a spectacular exhibit I saw at this year's Philadelphia Flower Show, where red-twig dogwood was underplanted with brilliant white crocuses. The combination was a perfect melding of beauty and simplicity to which no photograph could have done justice.

It's incumbent on the gardener, then, to take these ideas to the garden center, evaluate the suggested combinations in person, and determine if he or she personally likes the fusion.

Overall the book offers beginning gardeners a wealth of creative ideas for planning their gardens, and it contains enough innovative combinations to be of value to more experienced gardeners and landscape designers.

—Mark Miller

A horticulturist and garden designer, Mark Miller is deputy director of national programs for The American Horticultural Society.



GARDENER'S BOOKS

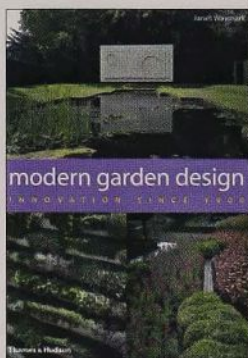
Noteworthy New Titles with an Eye for Design

GARDEN DESIGN can be approached from many directions, as the selection of recently released books on the topic indicates. Some lead you through the process of developing a design from scratch, others suggest ways to add new life to an old design. And if your interest in garden design leans toward the historic, there are books to fill that bill as well.

For a short course in garden design theory, John Brookes' *Garden Masterclass* (DK Books, 2002, \$40) is just the ticket. Brookes identifies and explains the principles of garden design with illustrated examples from around the world. Each chapter is devoted to an element of design, such as setting, shape, direction, levels, and enclosure. Al-

though his chapter on planting emphasizes the importance of selecting plants and styles that suit the location, Brookes goes on to cover textural and color combinations; cottage, prairie, meadow, and steppe plantings; designing with existing trees and shrubs, and "matrix planting" with perennials. Brookes provides examples based on his own designs and those of other innovative landscape designers.

Modern Garden Design: Innovation Since 1900 by Janet Waymark (Thames & Hudson, 2003, \$40) provides an overview of garden design in the last century. This one is not a "how-to" but a book about design theory as it evolved from the Victorian era through the age of Land Art. Waymark surveys the



work of outstanding 20th-century designers from around the world—from Gertrude Jekyll to Wolfgang Oehme and James van Sweden. Included are discussions about art and architecture in the garden, garden designs that address social concerns, and how the Americas set a course apart from colonial influences to develop their own styles. More than 200 illustrations—both photographs and line drawings—help define and exemplify the topics covered.

You can find both inspiration and practical suggestions for dealing with a wide range of design issues in ***Your House, Your Garden: A Foolproof Approach to Garden Design*** by Gordon Hayward (W. W. Norton, 2003, \$39.95). Hayward's designs focus on specific areas: from the entrance garden to side and back gardens, from patios to the areas between and around outbuildings. His approach is based on the principles he has employed in his

25-year career as a garden designer.

Each chapter is divided into two parts: design ideas, and "practical problems solved." Sketches of plans, as well as photographs and watercolor illustrations, complement the text as Hayward describes solutions for such issues as screening to hide utility areas or to provide privacy; planting over a septic tank or disguising the septic tank vent; integrating driveways and parking areas; and utilizing the awkward space under a raised deck.

Tired of mowing your front yard? Looking for alternatives to turf? ***Front Yard Gardens:***

Growing More than Grass by Liz Primeau with photographs by Andrew Leyerle (Firefly, 2003, hardcover: \$35, softcover: \$24.95) may have just the ideas you need to convert that sorry patch of grass into a collage of color and forms, combining site appropriate plants in a welcoming design. Primeau showcases more than 70 gardens from across the country that tackle the challenge of front yard design from a variety of perspectives. From small city gardens to expansive prairie landscapes, from minimalist gardens to opulent borders, this book is full of interesting options for anyone who is considering removing or reducing his or her lawn.

There are several worthwhile new books that can help you make the most out of specific areas of the landscape. ***Pool Scaping: Gardening and Landscaping***

Around Your Swimming Pool and Spa by Catriona Tudor Erler (Storey Books, 2003, \$19.95) shows you how to transform that "big blue box in your backyard" into an "oasis, complete with a waterfall...or a secluded tropical pleasure garden." With stunning photographs—many by Roger Foley—as well as watercolor illustrations, this book will inspire you to create a design that meets your needs for both practicality and beauty. Paving and coping material, fencing, planters, lighting, and of course, suitable plants are well covered. There is even an example of an organic swimming pool that employs bog plants rather than chemicals to keep the water clean.

For that shady corner of the yard, pick up ***Shady Retreats: 20 Plans for Colorful, Private Spaces in Your Backyard*** by Barbara Ellis, illustrated by Gary Palmer with architectural plans by Julie Burns (Storey Books, 2003, \$19.95). Whether your shady site is the edge of a woodland, a shaded terrace, deck, pergola, arbor, or an old-fashioned front porch, Ellis offers detailed plans and specific plants to add color and seasonal interest.

If serenity is what you seek, ***Feng Shui Garden Design: Creating Serenity*** by Antonia Beattie (Tuttle, 2003, \$18.95) may have the answer. *Feng shui* is the ancient Chinese art of placement.

This book explains how the principles of this art can be applied to designing a landscape that promotes the flow of energy and balances positive and negative forces. Use of light, color, sound,

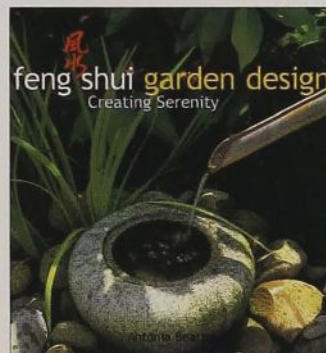
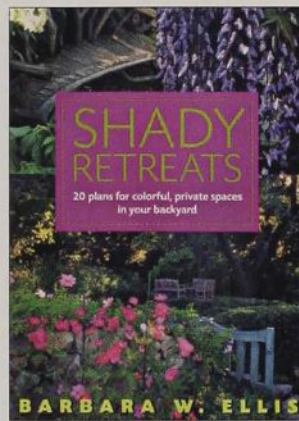
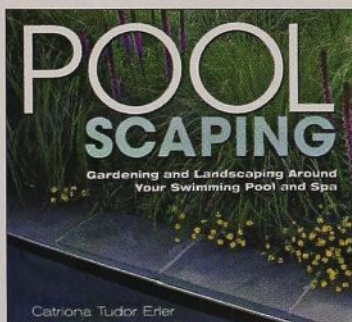
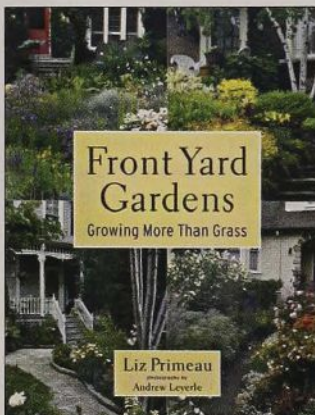
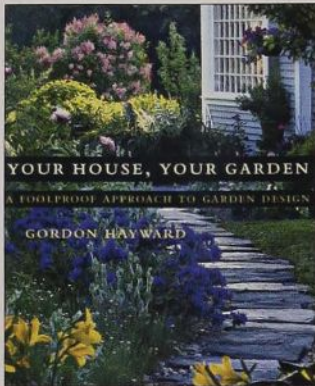
water, and movement are addressed. Abundant photographs by Leigh Clapp and easy-to-follow diagrams help illustrate concepts.

Adding stonework to a garden can help define boundaries, contribute drama, and set a mood. To learn how to achieve design-enhancing effects with stone, check out ***Garden Stone: Creative***

Ideas, Practical Projects, and Inspiration for Purely Decorative Uses by Barbara Pleasant with photographs by Dency Kane (Storey Books, 2002, \$29.95). Pleasant discusses the design and construction of stone walls and steps, pathways, rock gardens, and stone-enhanced water features. Photographs offer examples of a wide range of stone garden ornaments, including benches, lanterns, water bowls, and statuary. A chapter on "Working with Stone" takes the reader through the nuts and bolts of stone work, from collecting or purchasing the right material through moving, cutting, and setting the stone.

So before you get out your rakes and shovels to tackle any landscape renovation this fall, take the time to investigate the expert advice available at your library or bookstore.

—Rita Pelczar, Associate Editor





REGIONAL HAPPENINGS

Horticultural Events from Around the Country

NORTHEAST

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

SEPT. 19 & 20. **Invasive Plant Summit.** New England Wild Flower Society. Framingham, Massachusetts. (508) 877-7630 ext. 3204. www.newfs.org.

SEPT. 27. **Woodland Volunteer Day.** Nurture new saplings planted in the Abron's Woodland. Wave Hill. Bronx, New York. (718) 549-3200. www.wavehill.org.

SEPT. 27. **Dwarf Citrus for the Urban Gardener.** Garden demonstration. Wave Hill. Bronx, New York. (718) 549-3200. www.wavehill.org.

OCT. 3–OCT. 6. **American Society for Horticultural Science Annual Meeting and 100th Anniversary.** Rhode Island Convention Center. Providence, Rhode Island. (703) 836-4606. www.ashs.org.

OCT. 18 & 19. **Harvest Weekend.** Help bring in the harvest using 19th-century techniques. Old Sturbridge Village. Sturbridge, Massachusetts. (800) SEE-1830. www.osv.org.

OCT. 19. **Fall Family Festival.** Garden in the Woods. New England Wild Flower Society. Framingham, Massachusetts. (508) 877-7630. www.newfs.org.

OCT. 25. **Standish Harvest Festival.** Society for the Preservation of New England Antiquities. Marrett House. Standish, Maine. (207) 642-3032. www.SPNEA.org.

Looking Ahead

NOV. 8 & 9. **Orchid Sale.** Lyman Estate Greenhouses. Society for the Preservation of New England Antiquities. Waltham, Massachusetts. (781) 891-1985. www.SPNEA.org.

MID-ATLANTIC

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

SEPT. 20. **Gleaning the Essence of Your Garden: An Herbal Harvest Symposium.** Lectures and workshops. U.S. National Arboretum. Washington, D.C. (202) 245-5898. www.usna.usda.gov.

AHS SEPT. 20. **American Horticultural Society's Annual Gala.** The American Horticultural Society. River Farm. Alexandria, Vir-

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ginia. (800) 777-7931. www.ahs.org.

SEPT. 20 & 21. **Fall Wildflower Sale.** Virginia Living Museum. Newport News, Virginia. (757) 595-1900. www.valivingmuseum.org.

SEPT. 26 & 27. **Fairweather Gardens Open House.** Greenwich, New Jersey. (856) 451-6261. www.fairweathergardens.com.

AHS SEPT. 27. **Saturday Hort-Takes: Small Spaces Gardening.** Workshop and Demonstration. The American Horticultural Society. River Farm. Alexandria, Virginia. (800) 777-7931. www.ahs.org.

SEPT. 27. **Medicinal Plants Workshop.** Thomas Jefferson Foundation, Inc. Monticello, Charlottesville, Virginia. (434) 984-9822. www.monticello.org.

SEPT. 27 & 28. **68th Annual Dahlia Show.** National Capital Dahlia Society. Brookside Gardens. Wheaton, Maryland. (301) 949-8230. www.ncds.us.

OCT. 17. **Perennials for the Landscape and Garden Center Industries.** Conference. Co-sponsored by Hardy Plant Society/ Mid-Atlantic Group, Longwood Gardens, Pennsylvania Horticultural Society, and the Scott Arboretum. Scott Arboretum, Swarthmore, Pennsylvania. (610) 388-1000 ext. 507. www.scottarboretum.org.

SOUTHEAST

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

SEPT. 27. **Drying and Preserving Flowers.** Workshop. Callaway Gardens. Pine Mountain, Georgia. (800) 225-5292. www.callawayonline.com.

SEPT. 27 & 28. **A Patchwork of Violets.** Judged show and sale. The African Violet Council of Florida. Florida Mall, Orlando, Florida. (321) 269-3628. jdvette@gte.net.

OCT. 4 & 5. **Hibiscus Show and Sale.** The American Hibiscus Society. Fairchild Tropical Garden. Coral Gables, Florida. (305) 667-1651. www.ftg.org.

OCT. 10–12. **Charleston Fall Garden Show.** Gaillard Auditorium. Charleston, South Carolina. (843) 849-0865. www.Charleston-FallGardenShow.com.

OCT. 11. **Georgia Native Plant Society Annual Symposium.** Gwinnett Justice and Administrative Center. Lawrenceville, Georgia. (770) 343-6000. www.gnps.org.

OCT. 11 & 12. **8th Annual Carolina Bonsai Expo.** North Carolina Arboretum. Asheville, North Carolina. (828) 665-2492. www.ncarboretum.org.

OCT. 11 & 12. **Bonsai Show and Sale.** Bonsai Society of Miami. Fairchild Tropical Garden. Coral Gables, Florida. (305) 667-1651. www.ftg.org.

OCT. 16–19. **International Bamboo Festival.** American Bamboo Society. Fairchild Tropical Garden. Coral Gables, Florida. (305) 667-1651. www.ftg.org.

NOV. 1 & 2. **Palm & Cycad Show and Sale.** South Florida Palm Society. Fairchild Tropical Garden. Coral Gables, Florida. (305) 667-1651. www.ftg.org.

NORTH CENTRAL

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

SEPT. 18–20. **2nd Annual America in Bloom Symposium and Awards Program.** Hosted by the City of Chicago and the Chicago Park District. Millennium Park, Lincoln Park, and Chicago Botanic Garden. (614) 487-1117. www.americainbloom.org.

SEPT. 20. **A Garden for All Seasons: Autumn Walk.** Guided tour. Olbrich Botanical Gardens. Madison, Wisconsin. (608) 246-4550. www.olbrich.org.

SEPT. 20 & 21. **Illinois Gourd Society Show and Sale.** Chicago Botanic Garden. Glencoe, Illinois. (847) 835-5440. www.chicagobotanic.org.

SEPT. 20–NOV. 2. **Outdoor Autumn Garden Show.** Garfield Park Conservatory. Chicago, Illinois. (312) 746-5100. www.garfield-conservatory.org.

SEPT. 27 & 28. **13th Annual Barberton Mum Fest and Tribute to Ohio's Bicentennial.** City of Barberton Beautification Program and Yo-

der Brothers, Inc. Barberton, Ohio. (330) 848-6653. E-mail: lmclean@cityofbarberton.com.

SEPT. 28-OCT. 1. **2003 Perennial Production Conference.** Sponsored by *GrowerTalks* magazine. Pheasant Run Resort. St. Charles, Illinois. (919) 785-0631. www.ballpublishing.com/conferences.

OCT. 2 & 3. **Symposium on Creating Native Gardens.** Chicago Botanic Garden. Glencoe, Illinois. (847) 835-6829. www.chicagobotanic.org.

OCT. 11. **Urban Wetlands.** Field trip. Indiana Native Plant and Wildflower Society. Starling Sanctuary at Eagle Creek Park. Marion County, Indiana. (317) 232-8062. E-mail: rhedge@dnr.state.in.us.

OCT. 18-NOV. 30. **Chrysanthemum Show.** Lincoln Park Conservatory. Chicago, Illinois. (312) 742-7736.

OCT. 19. **Fall Foliage and Photography Walk.** Hike through the grounds with a professional photographer and get tips for taking photos. Stan Hywet Hall & Gardens. Akron, Ohio. (330) 836-5533. www.stanhywet.org.

OCT. 23. **Sowing the Seeds for Change: Restoration of Plant Communities.** Symposium. Chicago Botanic Garden. Glencoe, Illinois. (847) 835-8261. www.chicagobotanic.org.

SOUTH CENTRAL

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

SEPT. 26-OCT. 12. **Annual Texas Home and Garden Shows.** Sept. 26-28: Fort Worth Convention Center and Austin Convention Center; Oct. 3-5: Dallas Convention Center and Houston. (800) 654-1480. www.TexasHomeandGarden.com.

OCT. 4. **Rose Show.** Botanica, The Wichita Gardens. Wichita, Kansas. (316) 264-0448. www.botanica.org.

OCT. 30-NOV. 3. **American Society of Landscape Architects 2003 Annual Meeting & Expo.** New Orleans, Louisiana. (888) 999-ASLA. www.asla.org.

SOUTHWEST

AZ, NM, CO, UT

OCT. 4 & 5. **Fall Plant Sale.** Tucson Botanical Gardens. Tucson, Arizona. (520) 326-9686. www.tucsonbotanical.org.

OCT. 17 & 18. **Xeriscape Fair & Trade Show.** Sponsored by the Xeriscape Council of New Mexico with the City of Albuquerque Water Conservation Office. Albuquerque Convention Center. Albuquerque, New Mexico.

Hot Times at Tucson Chile Festival

DIG INTO THE desert harvest at the 17th annual La Fiesta de los Chiles, a celebration of the chile pepper that will be spicing things up at the Tucson Botanical Gardens on October 25 and 26. The festival will pay homage to this homegrown favorite with two days of food, music, crafts, and demonstrations.

"The chile pepper is a native that has become an important part of many different cultures around the world," says Kim Etherington, Chile Fiesta Coordinator at Tucson Botanical Gardens. "For us, being southwestern, it's the local botanical hero."



Fiesta guests can sample local, international, and specialty dishes that use chile peppers as their key ingredients to the tune of the Southwest's top musicians.

Handcrafted gifts, such as pottery and jewelry, will be for sale. Storytelling, face painting, and botanical crafts will keep children amused, while adults can learn about the history of the chile pepper. Organic gardening tips and presentations will help gardeners grow their own chiles.

In addition, the Tucson Botanical Garden's plant nursery will be stocked with approximately 20 different chile pepper plant varieties. Among these will be the chiltepin plant (*Capsicum annuum* var. *aviculare*), famous as the closest living relative of the earliest cultivated chiles. These round, fiery peppers grow wild from Peru to southern Arizona and were prized by Native Americans for their aid in healthy

digestion. Native Seeds/SEARCH, a Tucson seed bank that collects and grows out heirloom seeds, is supplying some of the specialty varieties.

If the fiesta gets too hot to handle, visitors can cool off by strolling around the five acres and 15 specialty gardens that make up the Tucson Botanical Gardens. For more information about the fiesta, call (520) 326-9686 or visit www.tucsonbotanical.org.

Disney Concert Hall Garden

AFTER FIVE YEARS of construction and 15 years of extensive planning, the Walt Disney Concert Hall will officially be unveiled in time to host the Los Angeles Philharmonic's fall 2003 concert season. And although the sleek lines and curved steel exterior of the Concert Hall are a marvel of modern architecture, and its acoustics are practically incomparable, its grandeur would not be complete without an equally stunning garden.

The garden became an even more crucial part of the concert hall construction plan when architect Frank Gehry decided to switch building materials from stone to steel. The steel's reflective qualities necessitated a vibrant garden that could illuminate the structure into living, shining art year round. To create a landscape that would complement his masterpiece, Gehry chose Melinda Taylor, a little-known designer.

By carefully selecting from 30 types of herbaceous perennials and shrubs and six flowering trees, Taylor designed the garden so that each season will have its own color scheme. Chinese pistache trees (*Pistachia chinensis*) help create fall color with gold, orange, and red blossoms, winter color with light pink and eventually deep blue berries. Hong Kong orchid trees (*Bauhinia blakeana*) accent the garden with lobed leaves and fuchsia flowers that bloom from fall through January.

Starting in January, large, fragrant, pink blossoms of pink snowball trees (*Dombeya cayeuxii*) flower until spring, when pink trumpet trees (*Tabebuia impetiginosa*) add their lilac-pink blooms to the mix. Overlapping this display, the naked coral tree (*Erythrina coralloides*) blooms from March through May with blazing red blossoms and is then joined by clusters of orange and yellow flowers of the Tipu tree (*Tipuana tipu*).

The 38,000-square-foot garden cost approximately \$5 million to create and will open to the public this fall. For more information, call (213) 972-3034 or visit <http://wdch.laphil.com>.

—Maureen Hartshorn Editorial Intern

OCT. 29-NOV. 2. **Writing in Response.** Writing workshop with Paula Panich. Sunglow Ranch. Pearce, Arizona. (413) 527-5210. www.dirta.gardenjournal.com.

WEST COAST

CA, NV, HI

SEPT. 20. **Re-opening of San Francisco's Conservatory of Flowers.** Friends of Recreation and Parks. San Francisco, California. (415) 750-5109. www.conservatoryof.flowers.org.

OCT. 4. **Autumn at Filoli.** Fall festival. Filoli Center. Woodside, California. (650) 364-8300. www.filoli.org.

OCT. 11 & 12. **9th Annual San Diego International Orchid Fair.** Sponsored by Quail Botanical Gardens. Del Mar Fairgrounds. Del Mar, California. (760) 436-3036. www.orchidfairsandiego.com.

OCT. 16. **North Bay Garden Tour.** Strybing Arboretum Society. San Francisco, California. (415) 661-1316. www.strybing.org.

NOV. 7-9. **Organic Seeds Production for Gardeners and Farmers.** Three-day intensive course. Occidental Arts and Ecology Center. Occidental, California. (707) 874-1557 ext. 222. E-mail: oaec@oaec.org.

NOV. 8 & 9. **Second Annual Beverly Hills Flower & Garden Festival.** City of Beverly Hills Recreation & Parks Department. Historic Greystone Estate. Beverly Hills, California. www.beverlyhillsgardenfestival.com.

NORTHWEST

AK, ID, MT, OR, WA, WY

OCT. 2-5. **Fall Home & Garden Show.** O'Loughlin Trade Shows. Portland Expo Center. Portland, Oregon. (503) 246-8291. www.oloughlintradeshows.com.

CANADA

SEPT. 19 & 20. **2003 American Horticultural Therapy Association Conference.** Presented by the AHTA and the British Columbia Chapter of the Canadian Horticultural Therapy Association. Victoria, British Columbia. (303) 370-8087. www.ahta.org.

SEPT. 27. **Seed Collecting Workshop.** Van Dusen Botanical Garden. Vancouver, British Columbia. (604) 257-8666. www.vandusengarden.org.

NOV. 3. **Topiary: The Art of Specialized Pruning.** Workshop. Van Dusen Botanical Garden. Vancouver, British Columbia. (604) 257-8666. www.vandusengarden.org.

GARDEN MARKET

CLASSIFIED AD RATES: All classified advertising must be prepaid. \$2.50 per word; minimum \$60 per insertion. Copy and prepayment must be received on the 20th of the month three months prior to publication date. To place an advertisement, call (703) 768-5700.

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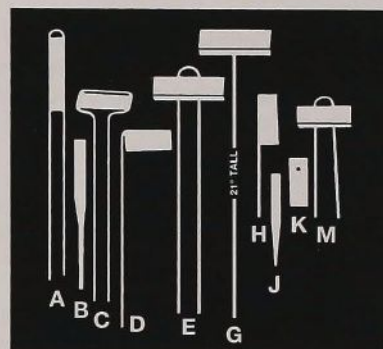
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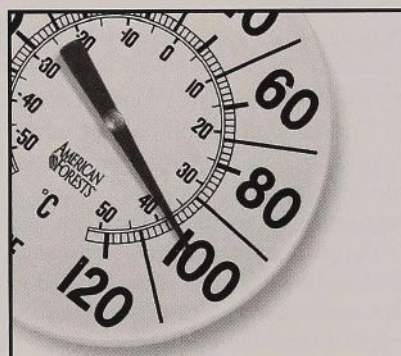
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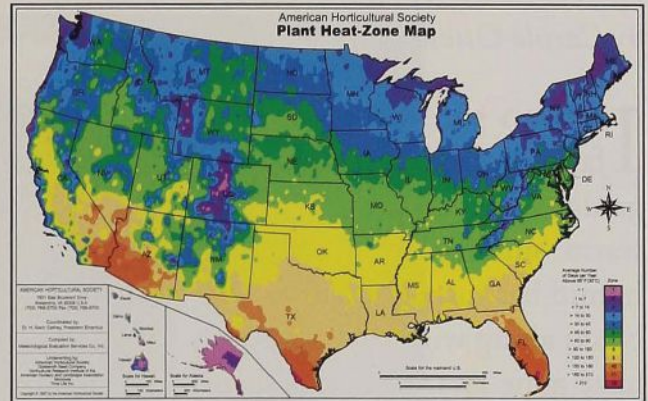


Safari Club International Foundation

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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.



A–C

Actaea alba ack-TEE-uh AL-buh (USDA 4–9, AHS 9–1)
Allium aflatumense AL-ee-um uh-fla-too-NEN-see (4–8, 8–1)
A. bolanderi A. boh-LAN-dur-ee (7–9, 9–4)
A. caeruleum A. see-ROO-lee-um (4–10, 10–1)
A. cernuum A. SAIR-new-um (3–9, 9–5)
A. christophii A. kris-TOF-ee-eye (3–9, 9–5)
A. cowanii A. koh-WAN-ee-eye (6–10, 10–6)
A. douglasii A. dug-LASS-ee-eye (7–9, 10–5)
A. drummondii A. drum-MON-dee-eye (6–10, 10–4)
A. flavum A. FLAY-vum (4–10, 9–1)
A. giganteum A. jy-GAN-tee-um (3–9, 9–5)
A. 'Gladiator' (4–8, 8–1)
A. 'Globemaster' (4–8, 8–1)
A. goodingii A. good-DIN-jee-eye (7–9, 10–5)
A. hollandicum A. hol-LAN-dih-kum (4–11, 12–1)
A. karataviense A. kair-a-tah-vee-EN-see (3–9, 9–5)
A. 'Lucy Ball' (3–8, 9–1)
A. 'Mars' (4–8, 8–1)
A. moly A. MAH-lee (3–9, 9–1)
A. 'Mount Everest' (4–8, 8–1)
A. neapolitanum A. nee-uh-pol-ih-TAN-um (7–9, 9–7)
A. nigrum A. NY-grum (5–8, 9–1)
A. oreophilum A. or-ee-OFF-ih-lum (4–9, 9–1)
A. 'Purple Sensation' (4–9, 9–1)
A. 'Rien Poortvliet' (4–8, 9–1)
A. rosenbachianum A. ro-zen-bahk-ee-AN-um (4–10, 10–1)
A. schubertii A. shoo-BUR-tee-eye (4–10, 10–1)
A. sphaerocephalum A. sfeer-o-SEF-uh-lum (4–11, 12–1)
A. stipitatum A. stih-pih-TAY-tum (4–9, 9–1)
A. texanum A. tek-SAN-um (7–10, 11–5)
A. thunbergii 'Ozawa' A. thun-BUR-jee-eye (3–8, 9–1)

A. triccoccum A. tri-KOK-um (3–8, 9–1)
A. triquetrum A. try-KET-rum (5–9, 9–4)
A. unifolium A. yoo-nih-FO-lee-um (4–9, 9–1)
A. ursinum A. ur-SY-num (5–7, 8–1)
A. zebdanense A. zeb-dah-NEN-see (4–9, 9–3)
Amorphophallus titanum uh-mor-fo-FAL-lus ty-TAN-um (11–15, 12–10)
Amsonia hubrichtii am-SO-nee-uh hew-BRIK-tee-eye (5–9, 9–5)
Bauhinia × blakeana baw-HIN-ee-uh blak-ee-AY-nuh (9–11, 12–10)
Calamagrostis × acutiflora 'Karl Foerster' kah-luh-mah-GROS-tiss ak-yew-tih-FLOR-uh (5–9, 9–5)
Callicarpa americana kal-lih-KAR-puh uh-mair-ih-KAN-uh (5–9, 9–1)
Cornus canadensis KOR-nus kan-uh-DEN-siss (2–7, 7–1)
C. racemosa C. ras-eh-MO-suh (4–8, 8–3)
Cotoneaster horizontalis koe-toe-nee-ASS-tur hor-ih-zon-TAL-iss (4–7, 7–3)

D–R

Dombeya × cayeuxii dom-BEE-yuh kay-YOOKS-ee-eye (13–15, 12–10)
Erythrina americana air-ih-THRY-nuh uh-mair-ih-KAN-uh (11–12, 12–10)
Fargesia nitida far-JEE-see-uh NIT-ih-duh (5–9, 9–5)
F. murielae F. myur-ee-EL-ee (5–9, 9–4)
F. robusta F. ro-BUS-tah (6–9, 10–5)
Filipendula ulmaria fih-lih-PEN-dyew-luh ul-MAY-ree-uh (5–9, 9–1)
Galanthus nivalis guh-LAN-thus nih-VAL-iss (3–9, 9–1)
Heteromeles arbutifolia het-ur-o-MEE-leez ar-byew-tih-FO-lee-uh (8–10, 12–8)
Lobularia maritima lob-yew-LAIR-ee-uh muh-WRIT-ih-muh (10–11, 12–1)
Nicotiana glauca nih-ko-shee-AN-uh ah-LAY-tuh (0–0, 12–1)

Pennisetum alopecuroides pen-ih-SEE-tum al-o-pek-yew-ROY-deez (6–9, 9–6)
Phaseolus coccineus fas-see-O-luss kok-SIN-ee-us (0–0, 12–1)
Pistachia chinensis pis-TAY-shee-uh chy-NEN-sis (6–9, 9–1)
Populus deltoides POP-yew-lus del-TOY-deez (3–9, 9–1)
Phytolacca americana fy-toh-LAK-uh uh-mair-ih-KAN-uh (5–9, 9–5)
Pyracantha coccinea py-ruh-KAN-thuh kok-SIN-ee-uh (6–9, 9–6)
Pyrus communis PY-russ com-YEW-niss (4–9, 9–1)
P. pyrifolia P. py-rih-FO-lee-uh (7–9, 9–4)
Rhododendron brachycarpum subsp. *tigerstedtii* ro-doh-DEN-dron brak-ih-KAR-pum subsp. ty-gur-STED-ee-eye (3–8, 8–1)
Rosa rugosa RO-zuh roo-GO-suh (2–9, 9–1)
Rosmarinus officinalis roze-muh-RY-nus oh-fiss-ih-NAL-iss (8–11, 12–8)
Rudbeckia fulgida var. *sullivantii* 'Goldsturm' rood-BEK-ee-uh FUL-jih-duh var. sul-ih-VAN-tee-eye (4–9, 9–1)

S–Z

Schizachyrium scoparium skits-ah-KEER-ee-um sko-PAR-ee-um (2–8, 8–1)
Sedum 'Autumn Joy' SEE-dum (4–9, 12–1)
Solidago 'Golden Fleece' sol-ih-DAY-go (5–9, 9–5)
Symplocarpus foetidus sym-plo-KAR-pus FEE-tih-dus (3–7, 7–1)
Tabebuia impetiginosa tah-be-BYEW-ee-uh im-peh-tih-jih-NO-suh (9–11, 12–9)
Tipuana tipu tip-yew-AN-uh TIP-yew (13–15, 12–10)

Autumn's Joys

by Carole Ottesen

IN MANY parts of the country, fall is the best time to be in the garden. The sun is comfortably warm: summer's hazy, hot, and humid has turned to crystalline brisk; along with the humidity have gone swarming clouds of gnats; the sky has deepened to endless blue. There is some irony in the fact that, in this season of sweet decline, only a few of the plants that have graced the garden remain faithfully ornamental to the end.

This autumn combination works so well because it combines grasses and perennials that exit with panache. It is true that many grasses come into their own in fall, but these two do so with a range of subtle colors and intriguing effects. The flowers of feather reed grass (*Calamagrostis x acutiflora* 'Karl Foerster'), lacy white in June, have formed tall, pale almond seed heads that are a subtle, but surprising contrast to the yellowing foliage. Little bluestem's (*Schizachyrium scoparium*) blue-green blades have deepened to a seasonable orange with tantalizing hints of crimson and blue. The sun dazzles the seed heads as the grass dances in the wind.



Perennial *Sedum* 'Autumn Joy' is well named. It, too, shines in this season. The flower heads, lettuce green in spring, pink in summer, have darkened to red-copper. They will continue their slow metamorphosis into winter, when they finish a rich copper-brown.

Black-eyed Susan's (*Rudbeckia fulgida* var. *sullivantii* 'Goldsturm') golden disk flowers were the stars of the summer garden. The seed heads that followed them, favored by flocks of birds, punctuate autumn's brilliant color

scheme as prickly dark-chocolate balls.

Bluestar (*Amsonia hubrichtii*) is a closet extrovert. In late spring, its pale blue flowers were all decorum, quiet and fine; all summer long, fine, threadlike leaves were neat, neutral, and green. Now frost has cast them a boisterous yellow. As the days pass, they will deepen into gold.

It could be argued that, with the exception of the black-eyed Susan, the grasses and perennials in this spectacular combination are more ornamental in decline and dormancy than they were during the growing season. In summer, the grasses were a green that faded into the background and the flowers of the sedum and bluestar, delicate pastels, best viewed close up. But in fall, after successive frosts, those quiet colors brighten to bold harvest hues. Few, but treasured, are the plants we grow for the way they look in dormancy.

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

Feather reed grass (*Calamagrostis x acutiflora* 'Karl Foerster'), pinkish white lacy flowers in June, grows 4 feet tall, tolerates clay soil, USDA Zones 5–9, AHS Zones 9–5.

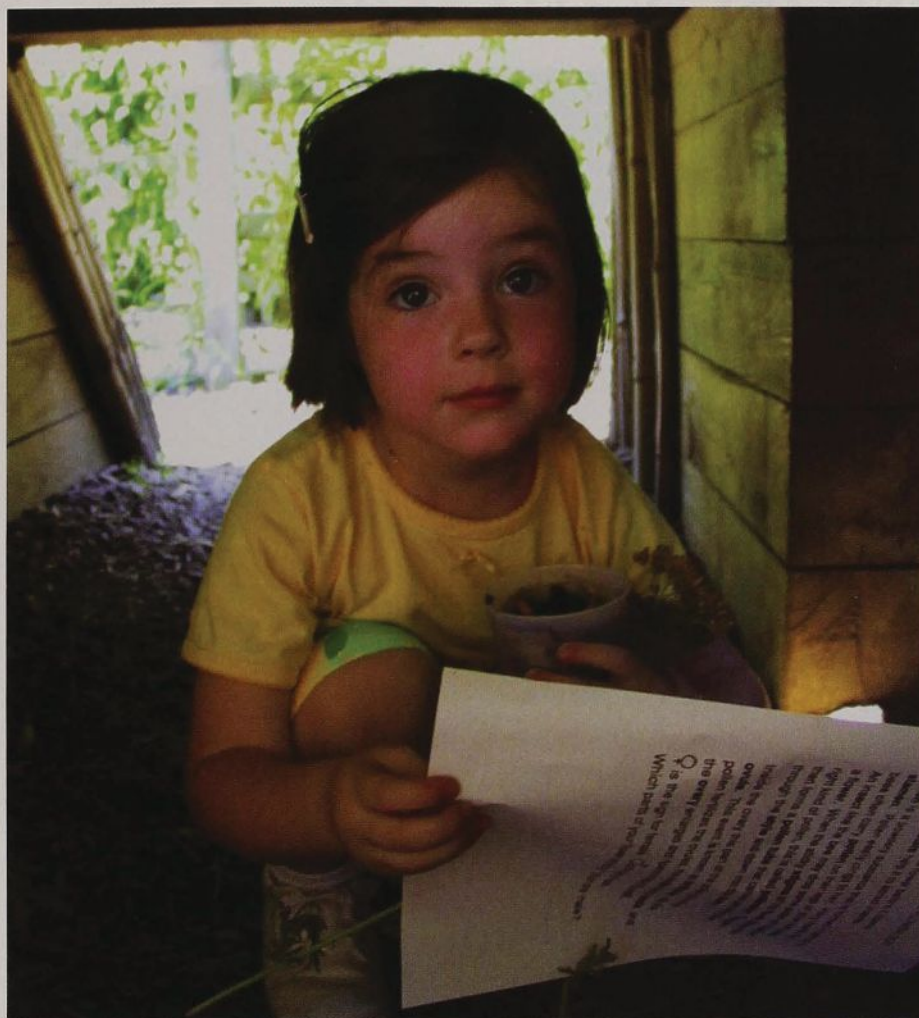
Little bluestem (*Schizachyrium scoparium*), grows 4 feet tall, tolerates drought, Zones 2–8, 8–1.

***Sedum* 'Autumn Joy'**, green flowers deepen with the season, grows 20 inches tall, dependable, Zones 4–9, 12–1.

***Rudbeckia fulgida* var. *sullivantii* 'Goldsturm'**, golden daisies in June and July, grows 2 feet, floriferous, Zones 4–9, 9–1.

Bluestar (*Amsonia hubrichtii*), blue flowers in May, grows 5 feet, pest free, deer resistant, Zones 5–9, 9–5.

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.

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Fertilization – Now is the Time

The fall season is a great time to fertilize your trees. During this time of year, roots are actively growing and are absorbing essential nutrients from the soil. These nutrients are stored within the tree and are available for immediate use when growth resumes the following spring. Fertilization is an important component of any well designed tree and landscape care program.

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