

# The American GARDENER

The Magazine of the American Horticultural Society

November/December 2000

## 10 Top Shrubs for Winter Berries

Best Native Conifers  
for the Garden

Expert Advice on  
Pruning Boxwoods

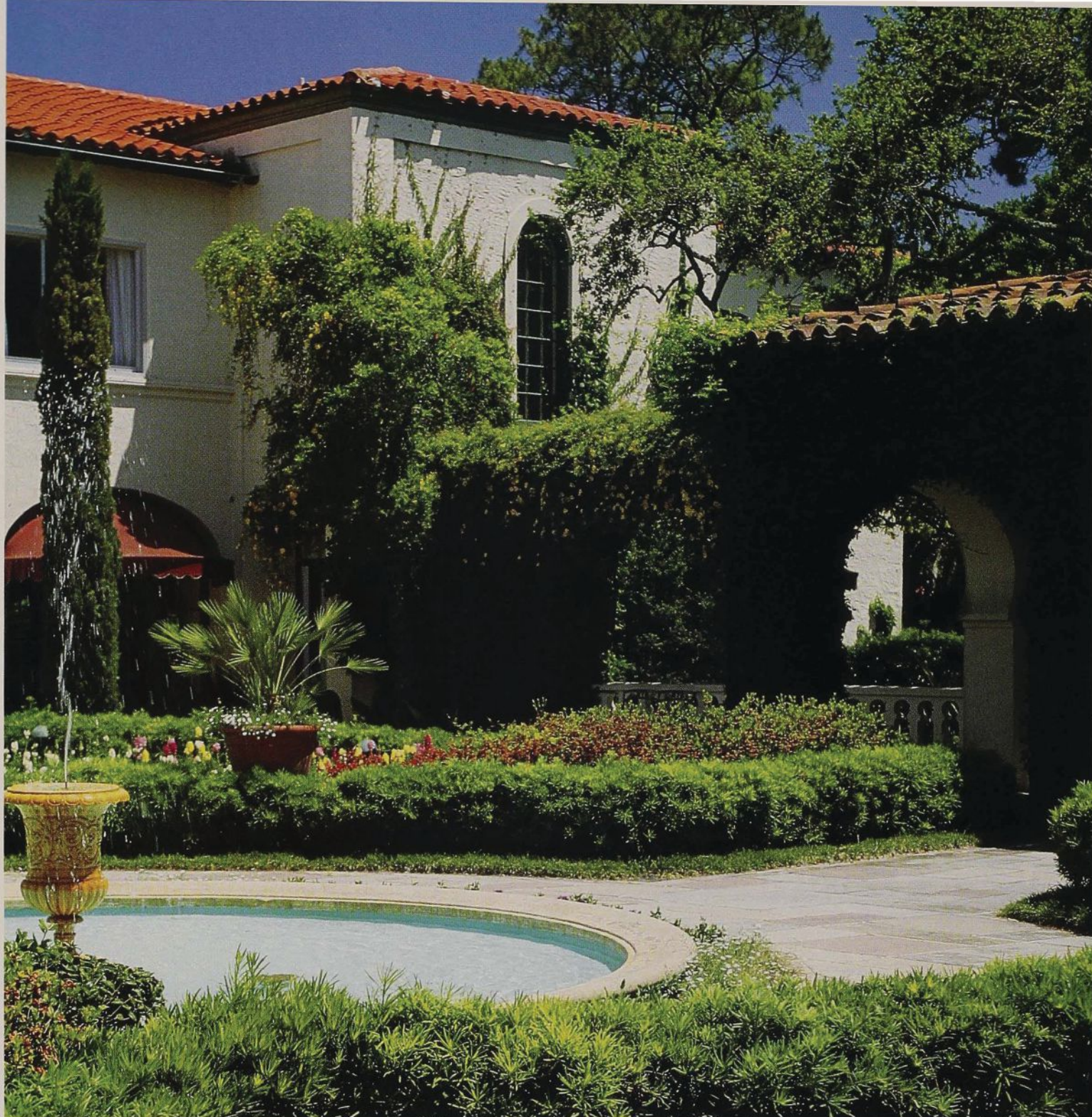


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## An Inside Look

**D**OING QUESTION-AND-ANSWER shows on live radio is truly living on "the edge." One never knows what the next subject will be. Even after more than 40 years of experience with this medium—from my first gardening Q-and-A show on a local station in Morrisville, North Carolina, to the current monthly features I am doing on National Public Radio—I continue to be amazed at the range of questions I am confronted with.

Our magazine this month confronts a similarly challenging range of gardening topics; fortunately we are able to rely on some of the most knowledgeable and talented horticulturists and garden writers around.

If you were looking for advice on the best native conifers for American gardens, you could hardly do better than to ask Susan Martin, curator of the conifer collections at the U.S. National Arboretum in Washington, D. C. In addition to providing descriptions and growing advice for 10 stately North American conifers, Martin lists compact cultivars best suited for smaller gardens.

Thinning boxwoods at this time of the year is the best way to keep them healthy. With the help of the professional arborists who take care of the trees and shrubs at the American Horticultural Society's River Farm headquarters, we provide tips and step-by-step instructions on properly pruning boxwoods.

Since this is also the time of year all gardeners are looking for plants that add color to the garden, we bring you garden writer Kathy Fisher's article on shrubs that display colorful berries in fall and winter. Not only will these shrubs light up the landscape, they will provide a food source for wildlife during the lean winter months.

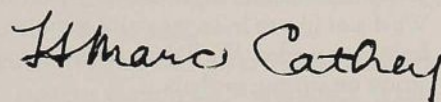
Some of the shrubs Fisher profiles were among the many native plants first collected in the wild by American explorers Meriwether Lewis and William Clark. As we approach the 200th anniversary of Lewis and Clark's epic journey through the American West, Associate Editor Rita Pelczar recounts the important role these explorers played in our horticultural heritage.

Speaking of journeys, if you haven't made your winter travel plans yet, author Rick Darke's article on Bok Tower Gardens may convince you to consider Lake Wales, Florida, as a destination. Darke reveals how this prominent public garden has achieved a successful confluence of horticulture and art.

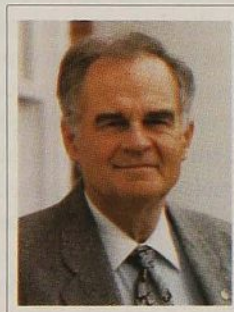
In the final installment of our Millennium Focus series, we review the influence of climate on North American gardening during the 20th century and look ahead at what the next century may hold. While regional weather patterns have been rather unsettled in the last few years, you may be surprised to learn what our meteorological expert has to say about the big picture.

Consider this and all issues of *The American Gardener* your "life line" to gardening. We are always trying to anticipate what will interest you and provide the latest information you need to be successful and environmentally responsible gardeners.

Ever in green and purple,



—H. Marc Cathey, *AHS President Emeritus*



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# Members' Forum

## THE [ALMOST] PERFECT PATH

The article "The Perfect Pathway" by Barbara Blossom Ashmun (September/October) was an "almost-perfect" discussion, but I must take exception to the statement that "in a woodland garden, paths covered with shredded bark, wood chips or pine needles are most in keeping with the informal setting."

I would argue that that is true *only* if one is talking about *woodland-styled* gardens, not gardens *in* a woodland setting. What is most in keeping with and practical for a garden in a woodland are bare paths that emulate trails through a forest. I have almost 1,000 linear feet of pathway meandering through my three-quarter-acre woodland; if I were to cover the paths with shredded bark, I would need some 26 cubic yards replenished every few years.

For pathways around the house, however, I do use a variety of paving materials: irregular flagstones for the paths to the front doors, rectangular flagstones for the path leading from the patio down into the back woods, and round concrete steppingstones to connect the front lawn with the back lawn. At one time the pavers for this last pathway were made of rounds cut

from an oak tree that had to be felled.

Incidentally, I thoroughly enjoy Colston Burrell's articles, including "Falling for Toad Lilies" (September/October). I had the pleasure of meeting him during a North American Rock Gardening Society annual meeting in Minneapolis and visiting his garden when he lived there. He is a truly knowledgeable plantsman.

William A. Plummer  
*Painted Post, New York*

## HELPFUL BULB TIPS

I so enjoyed "Spectacular Summer Bulbs" by John E. Bryan in the July/August issue. I would like to mention a bulb that was not covered in the article—naked lady lily (*Amaryllis belladonna*). This is the only bulb in my Zone 9 garden that is glorious during the triple-digit summer months. The funnel-shaped flowers of this amaryllis relative, borne before the leaves emerge, are a wonderful soft pink.

I will be adding some of your recommendations to my garden this fall! Thank you for the ideas.

Barbra S. McClung  
*Visalia, California*

## Outsmarted by Violets

A SMARTGARDEN™ tip that was included with the article on native violets in our March/April issue recommended removing faded violet flowers to control unwanted reseeding. Several members of the American Violet Society, including Kim Blaxland, who authored the article on native violets, pointed out that this technique is ineffective for most violets because of their slightly unorthodox reproductive practices.



Cleistogamous seed pods are visible at the base of this clump of violets.

The showy flowers of most *Viola* spp. actually produce very few seed pods; most viable seeds are produced from unobtrusive flowers that develop later in the summer. These flowers—termed *cleistogamous* because they rarely open and are thus usually self-pollinated—lurk under the foliage near ground level. The best way to reduce unwanted reseeding is to dig and remove plants in spring or early summer before the seeds are released.

A few violets, including the bird's-foot violet (*V. pedata*)—produce seeds from their showy flowers in the standard way. These flowers, termed *chasmogamous*, open to expose the reproductive organs to cross pollination.

## What's YOUR Favorite Cutting Flower?



IF YOU GROW FLOWERS, you probably have snipped a few now and then to bring indoors. Sometimes plants that you don't think of as cut flowers make beautiful indoor arrangements. The delicate green-yellow flower heads of dill, for example, provide a tall, airy accent to summer bouquets. Stems of boldly patterned coleus leaves can jazz up any arrangement; peony leaves can substitute for the usual filler fern; and humble spikes of hosta flowers pair nicely with a bouquet of roses.

We want to know your favorite flowers for cutting. Do you grow them in a separate bed in the garden, or do you mix your cutting flowers with your bedding plants? Write or e-mail us to let us know your favorite or most unusual plants for cutting. We'd also like to learn your tips for creating exciting fresh arrangements with plants from your garden. We'll share the best ideas with the rest of our readers in an upcoming article on cutting gardens.

Visit the November/December 2000 issue in *The American Gardener* section of our Web site ([www.ahs.org](http://www.ahs.org)) for a link to a convenient survey form that you can use to respond.

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



## Bulb Gift to Blossom at River Farm

VISITORS TO River Farm can look forward to an especially spectacular display of flowers next spring and in succeeding years, thanks to the generosity of a Dutch wholesale bulb organization that will be providing the American Horticultural Society (AHS) with an annual donation of bulbs. Howard McK. Tucker, a member of the AHS board of directors, was instrumental in facilitating the bulb donation, which was arranged through Henk Westerhof, chairman of the Royal Dutch Wholesalers Association for Flowerbulbs and Nurserystock. "This generous donation will enhance the beauty and diversity of the plantings at River Farm for many years to come," says Tucker.

This year's shipment featured more than 1,000 nursery-propagated bulbs representing 25 different selections of crocuses, daffodils, tulips, hyacinths, irises, ornamental onions (*Allium* spp.), and fritillaries (*Fritillaria* spp.). The crocuses include selections such as *Crocus x luteus* 'Dutch Yellow', *C. vernus* 'Remembrance', and the lavender-flowered *C. tommasinianus*. The daffodils range



Tulips and other spring bloomers donated by Dutch bulb wholesalers will bloom at River Farm this coming spring.

from popular cultivars such as 'Accent', 'Carlton', and 'Thalia' to lesser known selections like 'Mary Bohannon', 'Bridal Crown', 'Jetfire', and 'Tahiti'. 'Jetfire' has deep yellow petals and a red-orange cup. The flowers begin to open when the stems are short and continue doing so as the stems grow to peak length; the effect is flowers at a variety of heights blooming simultaneously.

The tulips include single and double late species, as well as lily-flowered and Darwin-hybrid tulips. Among these is 'Apricot Beauty', known for its sweet fragrance and the harmoniously blended shades of rose and apricot on its petals.

Janet Walker, the Society's director of horticulture, has integrated these bulbs throughout the existing display gardens at River Farm. "Flowering bulbs play an integral role in lengthening and enhancing a flowering perennial display," says Walker, "and this annual contribution will allow AHS to showcase some of the best, the most unusual, and the newest flowering bulbs for American home gardens."

## Art in the Garden

A DISPLAY OF metal sculptures by Washington, D.C., area sculptor Peter Wood this fall and winter marks the official launch of a rotating series of outdoor garden art exhibits at River Farm. Wood's exhibit includes eight outdoor sculptures that are located throughout the gardens and three indoor sculptures displayed in the River Farm Visitor Center. The show will continue into early spring.

Wood designs and creates his sculptures using a wide range of metals—including found objects and old farm machinery—and occasionally other materials, such as natural fibers. The sculptures are shaped, cut, bent, bolted, or welded together in imaginative ways. Wood says he prides himself on being able to take the industrial feel of steel and create the image of flowing and carefree movement.

"Gardens and art have been closely related throughout history, and this series will give local artists a venue to showcase current garden art," says Janet Walker, AHS's director of horticulture. Walker adds that the outdoor art exhibits "will provide River Farm's visitors with many opportunities to see how they might incorporate art in their own gardens."



A smiling metal sculpture at River Farm.



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IT'S TIME once again to share seeds from your garden with other members of the Society by participating in the annual AHS Seed Exchange Program. If you haven't become involved in this popular member program before, give it a try.

A list of the seeds available to members will be published in the AHS annual *Directory of Member Benefits*, which will be sent to you in early January.

You must be a member to participate in our free seed exchange. If you aren't already a member, it's easy to join. Just turn to the card between pages 56 and 57, call the membership office at (800) 777-7931, or visit [www.ahs.org](http://www.ahs.org).

## Youth Garden Symposium Proceedings Available

The published proceedings of this year's AHS Youth Garden Symposium (YGS) in Lake Buena Vista, Florida, are now available. The proceedings include the full content of the pre-conference session on designing children's gardens; summaries of the presentations by the keynote and concluding speakers; and copies of all the concurrent sessions, including handouts and curricula.

All attendees of the YGS 2000 have free access to the proceedings, which can be downloaded using a password from the AHS Web site ([www.ahs.org](http://www.ahs.org)). All attendees will by now have received a postcard listing the password.

If you did not attend this year's symposium, you can access the proceedings online for \$10 by calling the Society's Gardeners Information Service at (800) 777-7931 ext. 124 and paying by credit card. A printed copy of the proceedings can be obtained for \$20 by calling the same number, or by e-mailing your request, mailing address, and credit card number to [mpolito@ahs.org](mailto:mpolito@ahs.org).

## Gala Offers Magic Moment

A CRISP AUTUMN evening provided a perfect backdrop for the annual fund-raising gala held at River Farm in September. More than 300 people attended this year's event, titled "This Magic Moment." The master of ceremonies was the Society's own President Emeritus H. Marc Cathey. Among the highlights of the gala was the silent auction, at which hundreds of items donated by local and national businesses were auctioned to raise money for the upkeep and operating expenses of the Society's River Farm headquarters.

Thanks to the generosity and support of the attendees, more than \$30,000 was raised during the evening. A complete list of sponsors can be seen at left.

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#### CONTRIBUTORS

Dr. H. Marc Cathey  
Linda D. Hallman

Mr. & Mrs. Frank Nicolai  
Association Direct  
Mr. Charles H. Smith, Jr.  
Mr. & Mrs. Tom Dunnigan  
SunTrust Bank

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# SMARTGARDEN™ — Garden Clean-up

Fall is the time to prepare for next year's garden

As the growing season winds down, it is time for the forward-thinking gardener to engage in clean-up. A few simple tasks accomplished in late fall will have a major impact on the appearance of the garden through the winter, and more importantly, on its health and care next season.

## GENERAL CLEAN-UP

- Branches of trees and shrubs that have been damaged beyond repair—physically or by disease—should be removed. Stems that display disease symptoms such as cankers or sunken lesions are usually best removed as well to prevent the further spread of disease.
- Minimize next year's insect pests by removing and disposing obvious signs of infestation such as the "bags" of bagworms and the nests of fall webworms.
- Weed all gardens—do not let fall weeds go to seed.
- Rake leaves to avoid matting that may suffocate lawn or ground covers. Compost both weeds and leaves.
- Clean up and repair your tools.



## FLOWER BEDS AND BORDERS

Once they have succumbed to a heavy frost, most annuals look pretty ragged in the garden. Plants can be cut off at ground level, leaving the roots to break down in the soil; this is a particularly good practice where erosion is a problem. Another approach is to remove the plants, roots and all, before composting. The soil that clings to the roots will help "feed" your compost, because it contains organisms that are responsible for decomposing vegetation and turning it into valuable humus. Although the heat of an active compost pile will kill most weed seeds and many diseases, it is safest to exclude all plants that are diseased.

Perennial plants that die back in the fall can be cut to the ground—unless they contribute to your winter landscape or provide food or cover for desirable wildlife. Even after they turn pale brown, the leaves of epimediums offer subtle texture beneath deciduous shrubs and trees, many ornamental grasses are at their best when their dried plumes sway in the winter winds, and the dark russet seed heads of coneflowers (*Echinacea* spp.) and black-eyed Susans (*Rudbeckia* spp.) nourish birds through the cold months. These and other herbaceous plants that are valuable in your winter garden can be cut back in early spring before new growth begins.

Another consideration as you cut back old flowering stems of both annu-



als and perennials, is whether or not they self-sow, and if they do, how do you feel about it? To make the most of self-sowers, distribute the seeds where you would like new plants. On the other hand, if your bed is already too crowded, or if uniformity is important in your garden, carefully collect the seedheads before the seed is dispersed to prevent the growth of potentially variable seedlings. Those seeds that birds enjoy can be added to your feeder.

Be sure to mark the location of late-emerging perennials such as balloon flower (*Platycodon* spp.) and butterfly weed (*Asclepias tuberosa*) to avoid injuring them when working the garden in early spring.

As you trim and inspect your perennials, you may decide that some have become over crowded and require dividing. New divisions need time for their roots to establish or they may be damaged by winter cold; depending on where you live, it might be best to wait until spring before attempting to dig and divide your plants. If you expect several more weeks of relatively mild weather, however, most perennials that bloom in spring and summer can be divided in fall.

While mulching for winter protection is important, wait to apply it until you have had several hard freezes.

## VEGETABLE GARDENS

Fall clean-up of vegetable gardens can be complicated somewhat by late-season plantings, but, for the most part, vegetables follow the same routine as annual flowers.

If you clear your vegetable garden in fall, a cover crop such as winter rye, alfalfa, or clover can be sown to prevent winter erosion. The cover presents a neat winter appearance and the "green manure" adds substantial organic matter to your garden soil when it is turned under in spring. A layer of organic mulch is another option for covering your winter vegetable garden. It too will improve your soil when you till in the spring.

Collect, clean, and store cages and stakes that you plan to use again.

## READY FOR SPRING

While ridding the garden of unwanted debris, be sure to leave plants that provide food and cover for desired wildlife. While accomplishing these end-of-season chores, assess the successes and failures of the season and consider changes for the coming year so that you will be poised for action when spring returns.

Rita Pelczar, Associate Editor

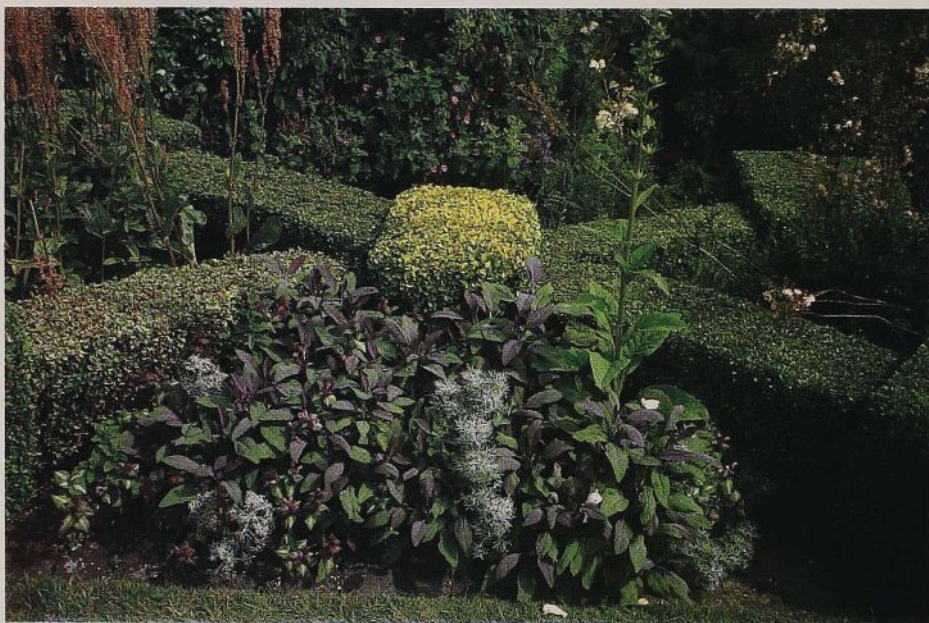


## A Peek Behind the Hedges in Southern England

by Rita Pelczar



**“Many of the gardens on the tour [to southern England] provided visitors with examples of techniques that could be easily adapted to their home gardens in the United States.”**



WHEN VIEWED FROM the sky, the landscape of southern England resembles a patchwork quilt: tall hedges enclose neatly tended gardens, country homes, and historic castles and separate them from the rolling countryside spotted with grazing sheep.

This past summer, a group of travelers led by award-winning tour guide Jeanie Carmichael and H. Marc Cathey, president emeritus of the American Horticultural Society (AHS), were treated to an intimate view of the gardens that lie behind those hedges. Beginning in London on June 25, participants in the AHS-sponsored travel study program, “Great Gardens of Southern England and the Hampton Court Flower Show,” visited 18 private and public gardens in 12 exciting days, as well as the famous flower show at Hampton Court Palace.

The mild climate in southern England is ideal for growing an astounding variety of plants. With a USDA Hardiness Zone of 8 to 9 and an AHS Heat Zone of 1 to 2, it is never very hot or very cold. And though rainfall averages only 18 to 24 inches per year, the near-constant mist provides plants with ample moisture.

Because space is at such a premium in southern England, gardeners in this region have become masters of getting the most out of limited areas. Many of the gardens on the tour provided visitors with examples of techniques that could be easily adapted to their home gardens in the United States.

Definition is frequently achieved by the use of precisely clipped hedges that divide a garden into distinct segments or rooms—each featuring a different combination of plants. This technique offers gar-

**Top: A red-white-and-blue display bed represents the colors of the Union Jack in this patriotic garden. Left: Clipped hedges divide a small space into miniature garden rooms.**



deners an orderly way to include a wide variety of plants in a small space and has the added benefit of sheltering plants from wind.

In contrast to the regimented forms and primly maintained lines of many of the gardens visited, color was observed in combinations that were anything but conservative. A vivid color scheme repeated in several gardens featured red, purple, and blue flowers growing in close proximity.

Another approach displayed at several of the small gardens and in small spaces of larger gardens was the use of a single, bold accent plant—especially a tropical species—to create a dramatic affect. “The British are berserk about hardy tropicals!” says Cathey. “Their palette [of plants] is infinitely larger than ours, and novelty is very much a part of what they do.” Particularly popular are such plants as bananas, Peruvian lilies (*Alstroemeria* spp.), and New Zealand flax (*Phormium* spp.), which give the gardens an exotic look—and which successfully overwinter in this mild climate.

Tour participants also noted that every window and wall in the small towns they visited was dripping with hanging baskets. And the British seem to favor colorful mixtures of plants in their suspended containers, unlike in the United States, where hanging baskets commonly contain only a single species.

Highlights of the trip included the Secret Garden and Tudor Knot Garden at Sudeley Castle, the exotic trees and shrubs of Stourhead’s walled gardens, the wild-flower-lined woodland walks of Siss-



inghurst Garden, and the fragrant roses at Exbury Gardens. The 2,000-year-old English yew at the entrance to the Manor House Garden in Hampshire, originally created by renowned landscape designer Gertrude Jekyll, was but the first of many inspiring visions at that location, with its neatly mowed grass paths winding through the only surviving and restored example of a Jekyll wild garden.

But perhaps the best parts of the trip were the many exclusive opportunities to tour private gardens and speak with those who nurture them. At Rosemary Verey’s Barnsley House garden, visitors were de-



Participants in the AHS study tour had a chance to visit Rosemary Verey’s garden, top left, and a rare opportunity, below left, to meet with the famed plantswoman herself, center. Above: Many exotic plants from tropical climates grow well in southern England, including this thriving banana tree.

lighted by Gallica roses, bellflowers (*Campanula* spp.), water lilies, and the bold apricot-orange inflorescences of foxtail lilies (*Eremurus* spp.); but most inspiring was the chance to chat with Verey herself.

Each garden visit was enhanced by Carmichael’s background information and fascinating historical tidbits. “She had the most delightful anecdotes about the places we visited and the persons who did or do now live there,” says tour participant John Coleman.

While most of us garden in climates far more limiting than those of southern England, we share many of the same challenges: how to use space and resources efficiently, how to combine colors and textures effectively, and how to continue to expand our gardening experiences and knowledge. The AHS “Great Gardens of Southern England” tour provided participants with inspiration on all counts.

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

**FOR INFORMATION** about AHS’s Travel Study program and an itinerary of upcoming tours, please turn to pages 24 and 25 of this magazine, visit the AHS Web site at [www.ahs.org](http://www.ahs.org), or call Mary Ann Patterson at (800) 777-7931 ext. 121.



# Gardener's Notebook

*Horticultural News and Research*

## 2001 PERENNIAL PLANT OF THE YEAR

THE PERENNIAL Plant Association (PPA) has just announced that the 'Karl Foerster' cultivar of feather reed grass (*Calamagrostis ×acutiflora*) is its selection for the 2001 plant of the year. This popular cultivar has long been prized for its ornamental attractiveness, versatility, and minimal maintenance requirements.

Hardy through USDA Zones 4 to 9 and heat tolerant in AHS Zones 9 to 5, 'Karl Foerster' is an erect, clump-forming grass suitable for sites in both full sun and part shade. It thrives in moist, humus-rich soils, but is tolerant of less fa-



Feather reed grass

vorable conditions. Plants form clumps about two feet in diameter and spread slowly by underground rhizomes.

The vertical growth habit includes a tight clump of slightly arching foliage two to three feet tall and flower stems to five or six feet in height topped by airy panicles of pinkish bronze flowers in mid- to late summer. These inflorescences gradually fade to pale brown but often persist into winter.

To create a dramatic effect in the landscape, the PPA recommends combining the cool-season 'Karl Foerster' with

herbaceous perennials that bloom in late summer and fall, such as fall asters (*Aster* spp.), coneflowers (*Echinacea* spp.), gayfeathers (*Liatris* spp.), and black-eyed Susans (*Rudbeckia* spp.).

'Karl Foerster' is widely available through mail-order nurseries, including Kurt Blumel, Inc. in Baldwin, Maryland ([www.blumel.com](http://www.blumel.com), 800-248-7584), and Greer Gardens in Eugene, Oregon ([www.greergardens.com](http://www.greergardens.com), 800-548-0111).

## EPA SAYS VERMICULITE POSES LITTLE HEALTH RISK TO GARDENERS

IN AUGUST the U.S. Environmental Protection Agency (EPA) announced the results of a study of potential health risks associated with gardening uses of vermiculite, a naturally occurring mineral long favored as a soil additive.

The study concluded that although some readily available horticultural vermiculite products were contaminated with very low levels of asbestos, health risks to home gardeners are negligible. The EPA warns, however, that horticultural professionals who regularly work with vermiculite products may face more serious health risks from dust inhalation. Excessive breathing of dust of any kind can cause respiratory illnesses, and inhalation of certain forms of asbestos has been linked to serious lung diseases, including cancer.

The EPA's investigation of vermiculite, which started in January 2000, was prompted by widespread public concern over possibly asbestos-tainted vermiculite products. The public furor was set off by a series of investigative articles in the *Seattle Post-Intelligencer* relating to vermiculite produced from a now-closed mine in Libby, Montana, that was found to be contaminated with tremolite, a potentially hazardous form of asbestos.

The EPA's testing was performed in two phases. In the first, 16 products from Seattle area stores were tested. Asbestos was detected in five, though only three contained levels high enough to reliably

quantify a percentage. In the second phase, 38 vermiculite products from around the country were tested. Asbestos was detected in 17 of these products, but only five contained quantifiable levels.

Since researchers reported a great deal of variability in their results—often asbestos was detected in one sample of a product, and not in another—the EPA recommends that consumers take certain precautions when using any pure vermiculite products. Among the agency's recommendations are:

- Work with vermiculite products outdoors or in a well-ventilated area
- Keep vermiculite damp during use to reduce the amount of dust produced
- Avoid bringing dust into the home on clothing

By taking such precautions, the EPA says consumers can further reduce the already minimal health risks associated with vermiculite's occasional use in home gardening.

No precautions are suggested for use of premixed potting soils that contain vermiculite—these are usually slightly premoistened and contain a fairly low percentage of vermiculite.

Possible alternatives to vermiculite in home-made soil mixtures include coir (compressed coconut fibers), peat moss, finely shredded bark, and perlite, but gardeners should still avoid inhalation of dust that can be generated from these alternative products.

"I agree that the risk from using vermiculite is low," says Carl Rosen, an Extension soil scientist at the University of Minnesota in St. Paul. "The bottom line is to make sure that the vermiculite is moist before working with it to prevent dust inhalation," he says. "I would recommend using a face mask or respirator when working with any product—not just vermiculite—that is dusty, to avoid unnecessary inhalation of particles."

For further information on the EPA vermiculite study, visit the agency's Web site at [www.epa.gov/asbestos/](http://www.epa.gov/asbestos/).



# Offshoots

## Squirrel Wars

By Shahid Khan

**A**M I THE ONLY ONE who has noticed, or have other folks found the birds and squirrels hungrier this fall than they have ever been? My feeder, which is large by most standards, needs replenishment every 48 hours. I have had it for six years and never seen the seeds go so fast.

The feeder in our suburban backyard sits on a seven-foot, four-by-four pole and looks like a gazebo. It is placed where I can see it through the window from the desk of my home office. At the moment, I am watching my former nemesis—whom I have named Olympic Squirrel—single-handedly hold off five large crows. If one of them dares invade his space, he leaps at it, front claws extended, and the offender deftly and respectfully hops out of reach.

Olympic Squirrel is one of a group of squirrels residing in our backyard, where the focal point is the feeder. He is the group leader, mostly because of his exceptional leaping abilities. When trying to reach the feeder, he crouches low on the four-by-four pole under the squirrel guard, wiggles his fat butt in anticipation, rockets up and away, grabs the bottom of the feeder, and hauls himself up into the sunflower seeds. These days, I watch and admire his ability, but in the beginning, things were very different.

Before Olympic Squirrel and I came to our current state of peace and an acceptance of each other's roles in life, I was angered and frustrated as I daily watched his species devour birdseed by the mouthful while my birds looked on hungrily.

In the early days of the squirrel wars—before the appearance of Olympic Squirrel—we lived in the country and Jake, my chocolate lab, was the primary weapon in my arsenal. I would open a door as quietly as possible (the hinges had to be greased regularly), then he would charge out growling. Jake took his job seriously and would try to jump up a 150-foot oak while his enemies looked down at him in disgust.

Although he never got close to catching a squirrel, I rationalized that Jake was getting his exercise from 15 to 20 missions a

day. And I imagined the accelerated beating of those little squirrel hearts with quiet satisfaction. But I soon realized that Jake wasn't getting any thinner, and my trips to the birdfeed shop weren't getting any further apart.

When we moved to the suburbs, I heard many stories from neighbors of advances against the squirrel scourge—but



the end was always the same: Eventual defeat. One friend's solution was rigging a large bell attached to a rope leading to his desk. When a squirrel stole the first seed from his birdfeeder, he would pull the rope vigorously, sending the startled victim scuttling. He amused himself thus for several months but eventually had to give up the game: He had to pull the rope so often that his neighbors began to complain.

In our yard, my father also tried various squirrel home remedies, including trapping and relocating them, chili paste, fly paper, grease: None of them worked.

Finally I decided to try a store-bought tubular metal contraption designed to be fitted to the feeder pole, with a baffle at the top—which the clerk guaranteed to be foolproof. I got out my toolbox, measured

the five-foot minimum distance, which is farther than the longest squirrel leap ever recorded, and installed my new defense system. Then I waited for the squirrels.

Down they came, tentatively, checking the terrain and chattering among themselves. The bravest among them started up the pole and disappeared under the contraption. Bumping his head on the bracket, he came down again. Soon another squirrel gave it a try, with the same result.

Over the next few hours I watched the critters desperately leaping straight up at the feeder and crashing down, some even chewing at the pole in frustration and spitting out small pieces of wood. Highly gratified, I congratulated myself and proudly announced my victory to one and all.

One day soon after, I looked up casually from my desk—and there in the feeder was the round gray rump and bushy tail of a squirrel! My victory had lasted barely a week. As I watched the squirrels, I noticed that only one—the largest of them—had the superior athletic ability required to set a new squirrel-leaping record and establish himself at the top of the birdfeeder chain, while his cohorts made do searching for fallen seeds in the grass.

I decided it was time to re-think our relationship. *Maybe* Olympic Squirrel's achievement was deserving of admiration. Clearly he was more than a worthy opponent. It was time to declare a cease-fire.

And so we have found peace, Olympic Squirrel and I. The birds have their turn at the feeder when he visits with his buddies on the ground every now and then. But Jake still sits at the patio doors and whines, ready to fight another day.

*Shahid Khan is a free-lance writer living in Brookfield, Vermont.*





# 2001 Great American Gardeners Annual Conference

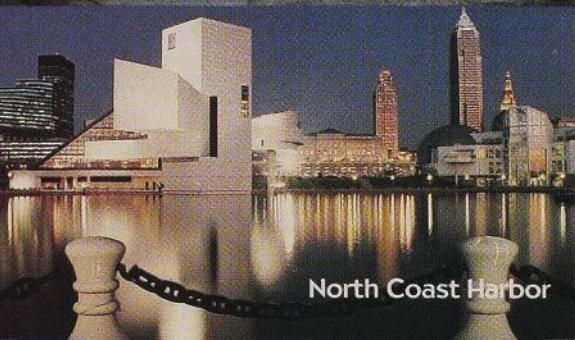
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CELEBRATE gardening excellence at the American Horticultural Society's 2001 Great American Gardeners Annual Conference in Cleveland, Ohio—home of the Cleveland Botanical Garden, Holden Arboretum, Cleveland Metroparks Zoo/Rainforest, and many spectacular private gardens.

You'll be inspired during this special three-day event by horticultural experts—including the 2001 AHS award winners—who will share their professional views and insights in lectures and panel discussions. You'll get a chance to meet other AHS members from across the country and trade a gardening tip or two. And you'll experience the charm of Cleveland's many public and private gardens in exclusive tours. Don't miss your chance to be part of the excitement!



Information about the speakers and tours scheduled for the meeting can be found on the AHS Web site [www.ahs.org](http://www.ahs.org).



# Gardeners Information Service

## STRESSED SWEDISH IVY

I have a Swedish ivy (*Plectranthus australis*) that was outside all summer in part shade. When I brought it indoors for fall, it started to shrivel up; now it's starting to die. I have it in a location that receives bright light and I'm watering it moderately. What am I doing wrong?

D.W., BELCHERTOWN, MASSACHUSETTS

Moving a plant indoors from outside places it under increased stress. Because humidity indoors is usually much lower than outdoors, leaves may shrivel and drop. You can increase the humidity around indoor plants by grouping them and setting their pots on gravel in trays of water. The gravel prevents the plants from sitting directly in the water, but as the water evaporates from the tray, it increases the humidity around the plants.

Check your plant for pests—mealybugs and spider mites are common pests of Swedish ivy. Both can be controlled with insecticidal soap, which is available at most garden centers and hardware stores.

Since Swedish ivy is such a fast-growing plant, it can become potbound, and yours may need repotting. It also can become woody and unattractive as it ages; when this happens, just grow new plants from cuttings.

## PRUNING CLIMBING ROSES

How and when should I prune my climbing roses? I have them against a stockade fence. Some have grown over the top, but I would like to cut them down a bit, as they seem to have some reedy stems. This summer they were pretty full on top, but I would like to get them a little fuller on the bottom.

C.M., QUEENS VILLAGE, NEW YORK

While the best time to prune climbing roses is immediately after flowering, climbers whose growth has become ungainly or bare at the bottom may need a more radical approach. Anytime after growth has stopped—in fall until early spring—cut back the rose to the height you desire, and thin it out if needed. You may need to completely detach it from the fence and

retrain it correctly, especially if branches have become crowded and are crossing. If so, detach and untangle the stems, handling them carefully. On a mature climber, an entire main stem that is old and unproductive can be cut to the base to stimulate new growth.

Refasten each healthy main stem on the fence, beginning with the lowest, keeping it as low and as horizontal as possible. This will provide you with your flowers at the bottom. Side shoots will also need to be secured, but if they do not conform to your desired framework, prune them back to two or three buds. Repeat with succeeding stems, spreading them out evenly in a fanlike arrangement along the fence.

Next season, prune side shoots after flowering to stimulate new growth. Tie in the new, lower growth to build up the framework, and continue to train shoots nearly horizontally.

*William May, Gardeners Information Service Master Gardener, and Marianne Polito, Gardeners Information Service Manager*

## The AHS Gardening Community Listserve

is a forum for discussion of gardening topics among participating members. Lively, often humorous, and always informative dialogues range from favorite gardening books to propagating ginger and attracting hummingbirds. The following excerpts from a recent posting provide a glimpse of the ideas shared over this dynamic gardening network. To join the fun, visit the AHS Web site at [www.ahs.org](http://www.ahs.org) and follow the instructions for the Listserve.

*The following exchange took place recently on the listserve:*

**I bet we're all looking for great additions to our gardens. What plants have you found to be stellar performers in your piece of Eden?**

L.Y., MEMPHIS, TENNESSEE

One of my favorite plants this spring was *Tanacetum niveum*. I started it from seed in spring 1999, and the first year it made silvery mounds of foliage. This spring the plants were entirely smothered with tiny white daisies that lasted about six weeks. Then I cut them down, and they started a new silvery mound. Some were one and a half feet high by four feet across; others were smaller. They would be perfect in a white garden.

L.S., READING, PENNSYLVANIA

I like plants that are easy to grow and are attractive and beneficial to insects and birds. Here are my three favorites:

1) *Asclepias incarnata* (swamp milkweed). About five feet tall and four feet wide, in spring and early summer it's covered with white and very light pink flowers. 2) Zinnias—such as 'State Fair Hybrids', 'Cactus Jewels Hybrids', mixed 'California Giants'. I like the tall ones that I can see from my kitchen window. Butterflies and hummingbirds are all over these plants for nectar. 3) *Hibiscus syriacus* (rose of Sharon). This is also great for attracting butterflies and especially hummingbirds.

E.F., GAINESVILLE, MISSOURI

**WE'RE READY TO HELP:** For answers to your gardening questions, call Gardeners Information Service at (800) 777-7931, extension 131, between 10 a.m. and 4 p.m. Eastern time, or e-mail us anytime at [gis@ahs.org](mailto:gis@ahs.org).





# Urban Gardener

## Indoor Composting: A Worm's-Eye View

by Chris Bright

**I**F YOU LIVE IN AN APARTMENT or condominium, you probably don't compost because you don't have land—but maybe you should consider starting. Composting is no longer an exclusive privilege of the gardener with a yard. Anyone, even apartment dwellers, can compost—with a little help from worms.

Composting with worms—vermicomposting—basically involves feeding your garbage to worms. Now you might ask: “Do I really want a box of garbage-eating worms in my apartment, just so I can apply their excrement to my potted plants?” Consider these reasons why you *should*: As a form of recycling, vermicomposting reduces your contribution to the solid waste stream. It produces a soil amendment far richer than ordinary compost or topsoil. It's an excellent tool for helping children understand natural processes. And finally, the reasons for *not* doing it turn out to be garbage, so to speak: Properly kept worm boxes *don't* smell; the worms won't escape; and they need little space, time, or money.

### Home Sweet Box

A basic worm box is a closed container with holes in the bottom and a plastic sheet underneath to catch stray compost. The box is filled with moistened bedding—usually shredded newspaper—and is home to a colony of redworms (*Eisenia foetida*). Vegetable scraps are buried in the bedding every few days. The worms eat both the scraps and the bedding, and excrete castings, a highly fertile “manure.”

You can make a worm box from wood or a converted plastic storage box, or buy them ready-made. Standard worm boxes cost about \$50; a deluxe, three-tiered version known as Can-O-Worms™ sells for more than \$100.

Redworms can be obtained for \$9 to \$25 per pound from mail-order suppliers, and at a higher cost from bait stores. Since worms do not like extreme heat or cold, avoid having them shipped when those conditions exist. It's best to stick with redworms—they tolerate a wide

range of temperatures and can live in fairly shallow containers.

As with other forms of composting, the main vermicomposting chore is separating your vegetable kitchen scraps from the rest of your waste. Keep meat out of your worm box to avoid odors and rodents.

To assist your worms, add a couple handfuls of garden soil to the box. It will undoubtedly contain some beneficial bacteria and fungi, as well as insects such as springtails, millipedes, and pill bugs. But there is no danger of having your apartment over-run: These bugs require worm-box conditions in order to thrive—and the

worm box requires them as well. Some break down the raw garbage into bits the worms can better digest. Others eat their dead colleagues. A well-kept worm box becomes a miniature ecosystem.

### Time to Harvest

After several months, the bedding and garbage has been transformed into vermicompost, which is ready to be used. If you garden outdoors, just transfer two-thirds of the box's contents, worms and all, to your plot. The remaining material usually contains enough worms to start another cycle.

If you plan to use the compost only on indoor plants, you will probably want nearly pure worm castings. By harvesting several months *after* you've stopped introducing vegetable scraps, the organisms eat everything, then die and decay. You're left with a moist, dark, earthy-smelling residue that resembles topsoil and makes an excellent soil amendment or top dressing. Don't use it alone as a growing medium, because it may have a substantial level of salts.

Of course, this technique will require you to buy new worms to start another cycle. The advantage of products such as Can-O-Worms™ is that worm-free finished compost ends up in the bottom tier, where it can be easily removed without disturbing the worms, which have relocated to the upper levels in search of food.

Once you get past any initial squeamishness, the idea of having a worm box in your home will grow on you.

*Chris Bright is a research associate for the Washington, D.C.-based Worldwatch Institute. His most recent book is Life Out of Bounds: Bioinvasion in a Borderless World, published by W.W. Norton.*

## Resources

**The Worm Book** by Loren Nancarrow and Janet Hogan Taylor. Ten Speed Press, Berkeley, California. 1998.

**Worms Eat My Garbage: How to Set Up & Maintain a Worm Composting System** by Mary Appelhof. Flower Press, Kalamazoo, Michigan. 1997.

## Sources

**Peaceful Valley Farm Supply**, Grass Valley, CA. (916) 272-4769.  
[www.groworganic.com](http://www.groworganic.com). Catalog free.  
■ Can-O-Worms™ composter, redworms.

**Worm's Way, Inc.**, Bloomington, IN. (800) 274-9676. [www.wormsway.com](http://www.wormsway.com). Catalog free.  
■ Can-O-Worms™ composter, redworms



# Climate Trends



## A Forecast for Gardening

BY GEORGE H. TAYLOR

THE SUMMER OF 2000 will be remembered for some pretty crazy weather and weather-related events. Devastating wildfires scorched more than 6.8 million acres across the nation, mostly in the West. Extreme temperatures and drought in the South and Southwest and the record-setting streak of rain-free days in Texas reminded old-timers of the Dust Bowl. Even San Francisco, normally a very cool place, had several heat waves, including one in which the temperature exceeded 100 degrees Fahrenheit. In contrast, the Northeast was rather cool and wet: Washington, D.C. had its coolest summer in almost 30 years. New Jersey experienced record-setting floods.

With all these strange goings-on, it's easy to start thinking that maybe those dire warnings about global warming or

the beginning of a new ice age are not so far-fetched. But to put this year's weather into perspective, it is helpful to look back 100 years or so to compare this season with seasons past. Just how much has our climate really changed, and what does it mean for our gardens?

### Assessing Trends

Before those questions can be answered, a little understanding of how climate data is collected is needed. Temperature and precipitation records have been collected in the United States for nearly 200 years, and currently there are more than 10,000 stations collecting data on a daily basis. Most of these operate under the auspices of the National Oceanic and Atmospheric Administration (NOAA) and are known as the NOAA Cooperative Stations. The

collected data is archived at the National Climatic Data Center (NCDC) in Asheville, North Carolina.

Many stations are located near airports or in growing urban areas and are strongly influenced by local land-use changes—such as population growth and increased numbers of vehicles—so their data may not be indicative of large-scale climate change. In the 1980s, the NCDC identified a number of reliable long-term stations that were considered to be good indicators of climate variations because their surroundings have

changed very little. Dubbed the Historical Climate Network (HCN), this set of stations provides us with reliable data for assessing climate trends (see box on page 18).



Caution must be observed, however, in analyzing climate trends. Because weather patterns are often cyclical, identifying arbitrary starting and ending points and calling the intervening years a "trend" can provide an incomplete picture. Studies that began 30 to 40 years ago—during a rather cool period in North America—indicate that in many areas the air has warmed and growing seasons have lengthened. This does not mean the trend will necessarily continue.

### Temperature Trends

Many scientists have suggested that temperatures in the future will rise as a result of global warming—a phenomenon caused by the buildup of carbon dioxide (CO<sub>2</sub>) in the atmosphere (see sidebar, page 58). Records for the United States



compiled over the last century indicate that while average annual temperatures have varied, they have not always increased. Recent decades have been fairly warm compared to 30 to 40 years ago but are generally comparable to those observed in the 1930s and early 1940s.

Not all regions of the country have experienced the same temperature variations. NCDC has identified trends for various regions in the United States. Most of the United States—especially the West—has seen a warming trend over the last 100 years. But some regions have not. The Southeast has seen a general decline in temperatures, with Alabama and Mississippi showing the greatest decreases.

### Growing Season Trends

Several researchers have suggested that the length of the growing season has been increasing in temperate regions. Jim Angel, state climatologist for Illinois, says that in the Urbana-Champaign area, “our season has increased by about 20 days, thanks largely to earlier last spring frosts.”

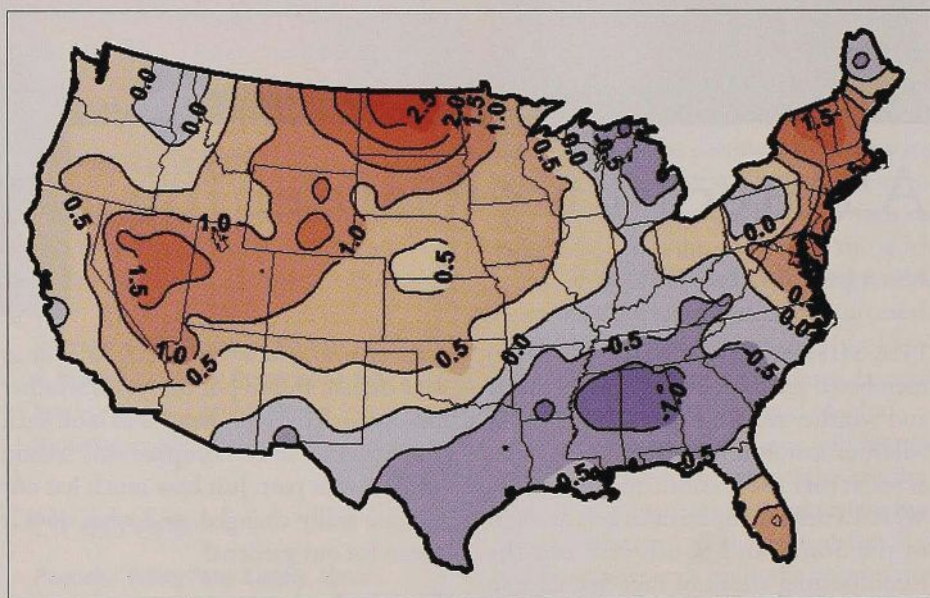
Last year, European scientists examined long-term records for a variety of plants and concluded that spring is arriving earlier and the growing season is becoming longer. While no such comprehensive studies have been done in the United States, several regional research efforts support the European findings. A recent study documented that the famous flowering cherries of Washington, D.C., are opening a week earlier than they did 30 years ago (see sidebar, page 20). Another study demonstrates that lilacs in both eastern and western states (*Syringa* spp.) are displaying similarly precocious habits, leafing out and flowering four to five days earlier than they did in 1959.

Temperature records from HCN stations for each region of the United States have been collected over the past century, and the local growing-season length calculated. The chart at the top indicates how the growing seasons have varied at each station.

Changes at most of the sites were quite subtle for the most part. There is evidence for long-term cyclical changes in some regions: periods of several decades with longer growing seasons, and periods of the same length with shorter seasons. Climate

## Historic Growing-Season Weather Data

HCN Station	Region	Changes in growing season
Napa State Hospital, California	West	very long growing season early in the century; shorter from 1910 to 1980; longer, more reliable seasons in the last two decades
Hallettsville, Texas	South	no discernible trend in either season length or variability
Savannah Airport, Georgia	Southeast	longer growing season from 1900 to 1950 than in recent decades; no apparent change in the last 25 years
Blue Hill, Massachusetts	Northeast	steady increase from 1900 to 1940; steady since 1940 (but fewer short growing seasons in recent decades)
Sparta, Illinois	Central	very little overall trend; a slightly shorter season in recent decades
Morris Experiment Station, Minnesota	North Central	steady increase in season length until 1950; little change since.
Olga, Washington	Northwest	longest growing season early in the century; shorter from 1920 to 1975, with longer seasons in the last two decades



Temperature trends for the United States in degrees Fahrenheit per 100 years for the period 1885 to 1994, as derived from data collected by the National Climatic Data Center.

ologists have identified such cycles in other data sets—ocean temperatures, Atlantic hurricanes, rainfall regimes—so it’s not surprising that they are evident in growing season length as well.

### Predictions for the Future

So what can we expect in the future? It’s

really hard to say, but I’ll stick my neck out and suggest some likely scenarios:

■ **Carbon dioxide (CO<sub>2</sub>) levels:** Likely to increase steadily for the next 25 to 50 years, perhaps leveling off after that. My best guess is that CO<sub>2</sub> will reach 500 to 600 parts per million during that time.

■ **Average temperatures:** as a result, are



## Growing Season in the Continental United States

Growing season can be defined as the period when plant growth takes place; however, this varies significantly for different plants. Coniferous trees, for example, can continue to grow and develop even under cold winter conditions, while tender, tropical plants such as bananas require temperatures of at least 60 degrees to continue in active growth.

It is helpful to apply a more specific definition for growing season according to three different climate regimes: Temperate, tropical, and Arctic.

In temperate regions (most of the continental United States) the growing season is the period between the last spring frost and the first fall frost—sometimes called the freeze-free period.

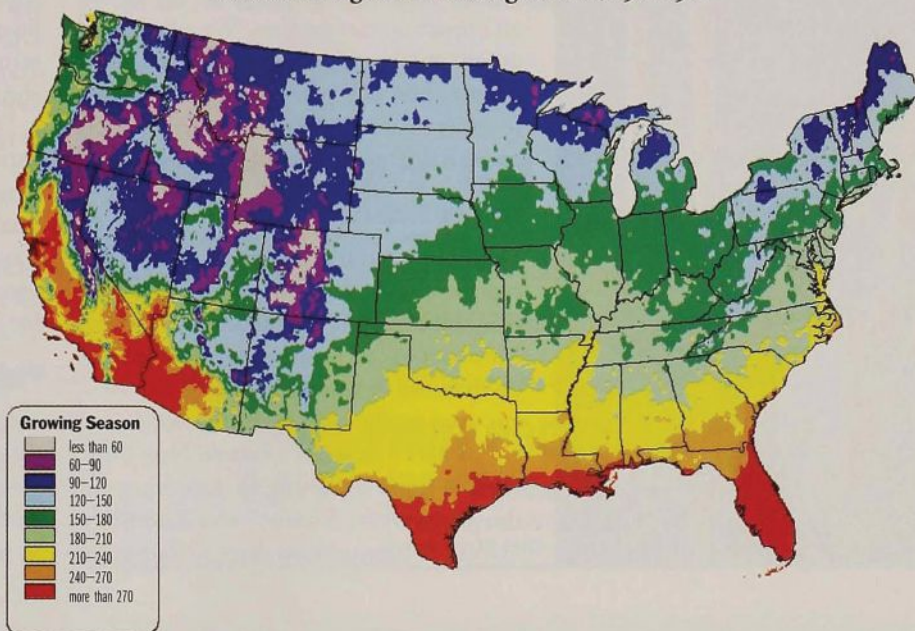
Because cold weather is virtually nonexistent in tropical regions, the growing season is often defined by the amount of available moisture. Winter is usually the dry season.

In Arctic regions, the growing season is defined as the freeze-free period; it is very short but vigorous due to very long summer days.

When gardeners ask

“What kind of plants can I grow in my area?” they often mean, “Will the growing season be long enough for my plants to prosper?” The average growing season is a useful statistic, helping gardeners select the plants best suited for their areas. —G.T.

Median Length of Growing Season, 1961–90



Here is a new map from the Spatial Climate Analysis Center of average growing season length in the continental United States. Note the relative uniformity of season length east of the Rockies, where topography is relatively uniform, and the much more complex patterns in the mountainous West.

likely to increase somewhat (my guess is one to two degrees Fahrenheit), especially in higher latitudes. Winter and nighttime temperatures are most likely to increase, while daytime and summer temperatures should change very little. This assumes, of course, that no significant natural variations occur! If solar radiation changes, if volcano activity increases, if ocean circulations change—and all of them have varied in the past—they may dwarf any temperature changes caused by greenhouse gases (see sidebar, page 58).

■ **Extreme temperatures:** The lowest winter temperatures may be moderated somewhat. Extreme high summer temperatures are unlikely to change.

■ **Storms:** No convincing evidence has been found to show that hurricanes, violent tornadoes, and other extreme events are more common now than they were 50 or 100 years ago. Greater attention is now being paid to severe weather than ever before, thanks in large part to The Weather Channel and other media outlets. But storms have not increased, and deaths resulting from severe weather have actually declined.

■ **Insect pests:** Some varieties of insects thrive during mild winters and are controlled largely by cold winter conditions. Milder winters may enable these pests to propagate more freely.

■ **Precipitation:** There is some evidence

that precipitation is increasing in the United States, but the same cyclical patterns described for temperatures seem evident in the precipitation data as well, so trends are difficult to detect.

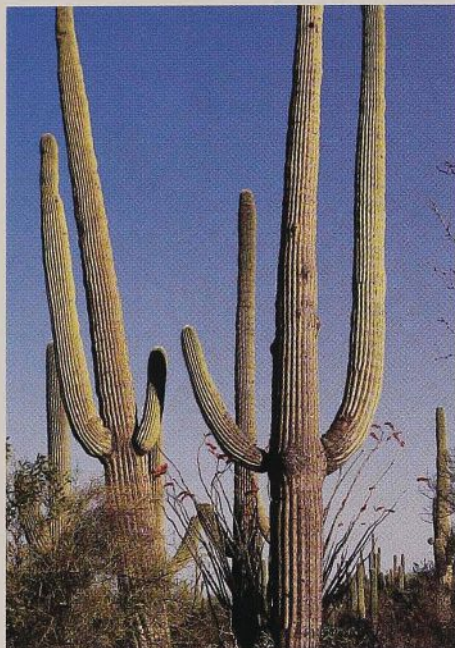
■ **Growing season:** Finally, we can expect some slight increases in growing season length to occur, again barring any significant natural variations. For most gardeners—including this one—a longer growing season is good news indeed!

*State climatologist of Oregon, George Taylor is a faculty member at Oregon State University's college of Oceanic and Atmospheric Science, and past president of the American Association of State Climatologists.*



# Regional Weather Reports: Millennium Edition

BY RITA PELCZAR



WHETHER OR NOT the past growing season represents part of a climate trend, a cyclical pattern, or a typical season, it had an impact on our gardens. We asked plant experts and home gardeners from across the country how this year's weather compared to other seasons, and how it affected their gardens. Here are some of their responses:

## West and Southwest

High temperatures and low rainfall were experienced in most of the West and Southwest. Linda Thornton of Tucumcari, New Mexico, noticed drought-stress symptoms on trees and shrubs throughout New Mexico, even on the resilient cottonwoods.

"Where I garden, in eastern New Mexico, the earth is turning to dust except in the places where I water," says Thornton. "Usually I have to mow three to four times

a year. I have a mix of drought-resistant grasses—Bermuda, Muhly (*Muehlenbergia* spp.), buffalo—this year I didn't get out the lawn mower once—just used the string trimmer where I water the trees and shrubs."

Thornton observed that the usually thriving grasshopper population was nearly non-existent this year, "I suspect the animals that depend on insects are going to have a tough time. Same for the seed-eaters, since this has been the worst year for wildflowers I've ever seen."

## Pacific Northwest

Extension agent Mary Robson of King County, Washington, notes that her region has experienced several odd seasons in the past 15 years, primarily with respect to precipitation. They experienced record

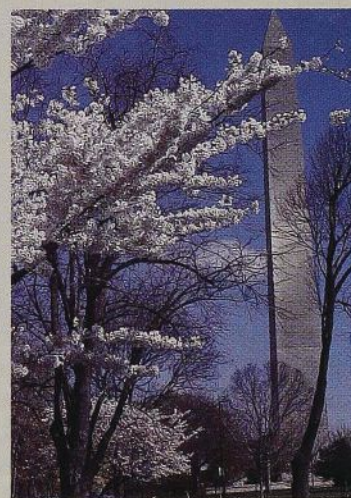
## Earlier Flowering Dates Observed

The famous Japanese flowering cherries that line the Tidal Basin in Washington, D.C., are blooming about a week earlier than they did 30 years ago. Researchers from the Smithsonian Institution's Department of Botany recently released the results of a 30-year study that tracked the flowering dates of 100 species of plants common to the Washington, D.C., metropolitan area.

Oriental cherries (*Prunus serrulata*) and Yoshino cherries (*P. yedoensis*) reach their peak blooms six and seven days earlier, respectively, than they did at the beginning of the study. And cherries were not the only plants with earlier flowering dates; 89 of the 100 species studied displayed a continuing trend of earlier flowering each year. The average flowering date for plants studied was 4.5 days earlier in 2000 than in 1970.

Botanist Stanwyn Shetler of the Smithsonian's National Museum of Natural History, one of the authors of the study, explains that the consistently earlier flowering of the vast majority of species studied indicates that the growing season of this region is gradually expanding. If the trend continues, it will likely have an impact on the composition of local flora: Those plants that require a long cold season may die out, while invasive species from warmer regions may become more serious problems.

Similar studies are being conducted in other regions. The University of Alberta's Devonian Botanic Garden has been gathering data on flowering times along with other discernable changes in life cycles for eight common plant species, including common lilac (*Syringa vulgaris*) and serviceberry (*Amelanchier alnifolia*). Using computers to collect information from volunteers, this program, called Plantwatch, is gathering data from locations across Canada, parts of the United States, several European countries, and Japan. If you are interested in learning more about this program or becoming a Plantwatch volunteer, visit its homepage: [www.devonian.ualberta.ca/pwatch](http://www.devonian.ualberta.ca/pwatch).



Cherry blossoms in Washington

—R.P.



snowfall—21 inches—in 1996, and near record amounts of rainfall in 1997. In contrast, Robson explains, “During the winter of 1999–2000, we had fewer than 6 days of freezing temperatures, more clear days than normal, and no snow at all.”

This past summer was a dry one in western Washington. “We had less than an inch of rain each month in July, August, and September, leaving gardens very dry indeed,” comments Robson. “But that’s normal for the modified Mediterranean climate we have.” Though many people think of the Seattle area as being subject to constant rain, “what’s more common,” explains Robson, “is that we have a lot of cloud cover even on dry days.”

The mild temperatures of recent years may be building a false confidence in local gardeners with respect to the range of plants that they can grow. Robson says, “People are under the belief that a lot of marginally hardy plants are actually thriving here because their survival hasn’t been tested in the last four winters.”

#### South Central

Tim D. Davis, resident director and professor at Texas Agricultural Experiment Station in Dallas, Texas, reports that this season will be remembered as brutally hot and dry in Texas, even though it started out very mild. June in the Dallas–Fort Worth area was one of the coolest and wettest on record. But in July, the weather abruptly turned hotter and drier than normal. “We experienced around 45 days of 100 degree-plus high temperatures. The normal number of days at 100 degrees or above is about 15.”

Davis observes that only the very toughest plants such as firebush (*Hamelia patens*) and goldstar esperanza (*Tecoma stans* ‘Goldstar’), were able to handle the stress and remain in good shape. Even relatively drought-tolerant plants such as live oaks (*Quercus* spp.) have suffered.

“But in Texas,” comments Davis, “we also have to remember that abnormal weather is not that uncommon. It seems like we are always setting some sort of weather record in Texas!”

#### Rocky Mountains

Temperatures were also higher in the Rocky Mountains this season. “We have had about 20 years of cold, wet summers here. This



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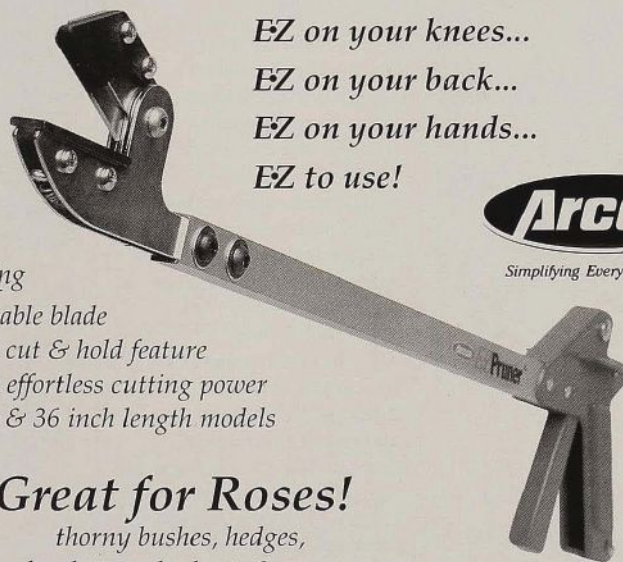
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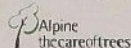
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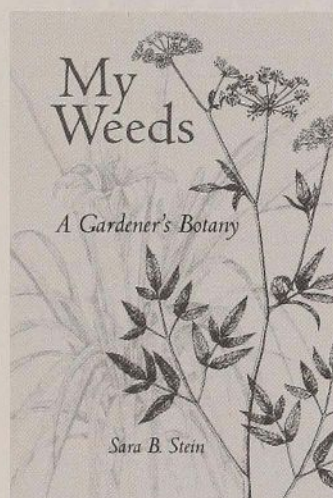


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## My Weeds

*A Gardener's Botany*

Sara B. Stein

• "An elegantly written, thoroughly researched study . . . that manages to be at once a meditation, a memoir, and a scientific treatise."—*Kirkus*

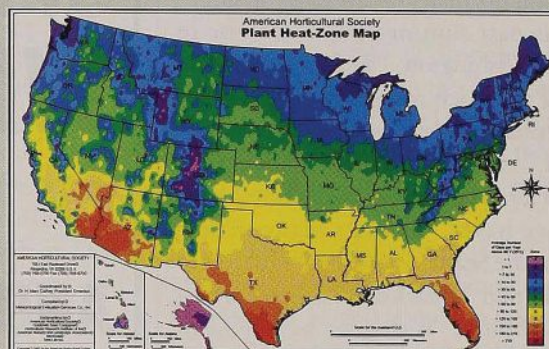
• "Think of the author as a sort of jujitsu gardener; in her hands the very strengths of weeds are turned to her advantage."—*New York Times Book Review*

• "In this manual philosophical treatise, Stein discloses an amazing amount of information, from anatomy to propagation, about more than 100 species of North American weeds."—*Washington Post Book World*

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## Heat and Hardiness Zones Maps



Temperature is a critical factor that limits the plants that will thrive in any region. Knowing your USDA Hardiness Zone and your AHS Heat Zone will help you select plants that are suited to the temperatures in your garden. The first is based upon the average minimum temperatures for your area, and the latter is based on the annual number of days when the temperature exceeds 86 degrees Fahrenheit. Of course, other factors such as soil, moisture, and exposure need to be considered as well when you are choosing plants for your garden, but knowing the hardiness and heat zones of a plant is a good place to start.

**AHS Plant Heat-Zone Map.** Available for \$9.95 from the American Horticultural Society. These can be ordered from the Society's Web site ([www.ahs.org](http://www.ahs.org)), or by calling (800) 777-7931, ext. 0.

**USDA Plant-Hardiness Zone Map.** CD-ROM available from American Nurseryman for \$9.95. (800) 621-5727. [www.amerinnursery.com](http://www.amerinnursery.com).

summer seemed really hot and dry," says Jim Knopf, a landscape architect in Boulder, Colorado. While records suggest that this summer was only a little warmer than usual, it was much warmer than many recent summers.

"The effect on plants has been remarkable," reports Knopf. "For example, people have had real difficulty with tomatoes for years; this summer was much better. My buffalo grass loved the warmer afternoons." Knopf observes that desert plants that need hot summers to bloom, such as California fuchsia (*Zauschneria* spp.) and *Zinnia grandiflora*, performed much better in 2000 than in the preceding years that experienced cooler summers.

But not all plants thrived in the heat. "Pansies usually bloomed all summer in the recent 'Alaskan summers' in my yard—not this year. They fried."

### Northeast

Cooler summer temperatures were reported in much of the



## Resources

**Heat-Zone Gardening: How to Choose Plants That Thrive in Your Region's Warmest Weather** by H. Marc Cathey with Linda Bellamy. Time-Life Books, Alexandria, Virginia, 1998.

**Sunbelt Gardening: Success in Hot-Weather Climates** by Tom Peace. Fulcrum Publishing, Golden, Colorado, 2000.

**The Undaunted Garden : Planting for Weather-Resilient Beauty** by Lauren Springer. Fulcrum Publishing, Golden, Colorado, 2000.

**Weather in the Garden** by Jane Taylor. Trafalgar Square Publishing, North Pomfret, Vermont, 1998.

**Climate Prediction Center**  
[www.cpc.noaa.gov/](http://www.cpc.noaa.gov/)

**National Climatic Data Center**  
[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

**Regional Climate Centers**  
[www.ncdc.noaa.gov/regional/climatecenters.html/](http://www.ncdc.noaa.gov/regional/climatecenters.html/)

**Spatial Climate Analysis Service**  
(Climate maps of the U.S. Many of them downloadable for free.)  
[www.ocs.orst.edu/prism/prism\\_new.html/](http://www.ocs.orst.edu/prism/prism_new.html/)

**State Climate Offices**  
[www.ncdc.noaa.gov/stateclimatologists.html/](http://www.ncdc.noaa.gov/stateclimatologists.html/)

**USDA National Arboretum Plant Hardiness Zone Map**  
[www.ars.grin.gov/ars/beltsville/na/hardzone/ush2map.html](http://www.ars.grin.gov/ars/beltsville/na/hardzone/ush2map.html)

Links to these Web sites can be found under the November/December 2000 magazine links in *The American Gardener* section of the AHS Web site ([www.ahs.org](http://www.ahs.org)).

Northeast. In parts of Maine, this combined with an outbreak of late blight with the result that tomatoes were not able to ripen before frost killed the plants, reports Dave Fuller of the University of Maine Cooperative Extension Service. Fuller observes that lawns thrived this season. "The lawns of the western foothills did not go dormant as they often do, so we had to keep up a regular mowing schedule."

Cranberry grower Charles Armstrong explains that cranberries needed little irrigation this year but, "disease pressure was higher due to the moisture." He experienced more red leaf spot on his plots and notes that other growers experienced above-average levels of fruit rot.

"Some crops responded nicely to the change, others did poorly," says Extension educator Marjorie Hundhammer of Hancock County, Maine. While gardeners needed to do very little supplemental watering, several insect pests including squash bugs were prevalent. "Cucurbits [squash, melons, gourds] seemed to perform the most poorly this year," comments Hundhammer. "Cool-season

crops, on the other hand, such as broccoli and peas did quite well."

### Mid-Atlantic

Much of the central East Coast, which experienced drought in recent years, enjoyed a much cooler, wetter growing season in 2000. Michael Newell, horticultural crops manager at the University of Maryland's Wye Research and Education Center, says, "This year was a 180-degree turn from last season, although in early spring it started out warmer and drier than it finally turned out." For perennial fruit crops such as apples, this resulted in an extended harvest season in contrast to last year's very concentrated harvest period.

Newell reports that asparagus quality was better, with "not as much lost to over-maturity." But tomatoes, corn, and watermelon planted for early harvest were slower to mature. And diseases were more troublesome than usual, particularly those that are soil borne. Newell notes, "This seems to have been a year where if you

*continued on page 58*

## Leave a Legacy

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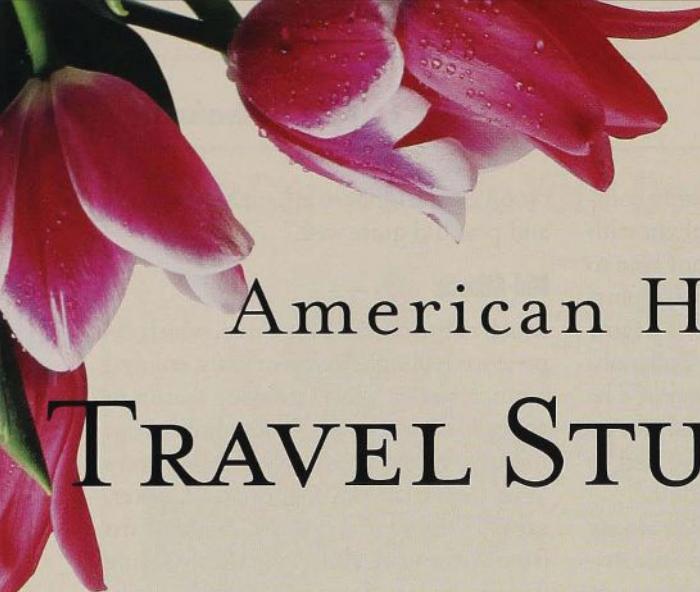
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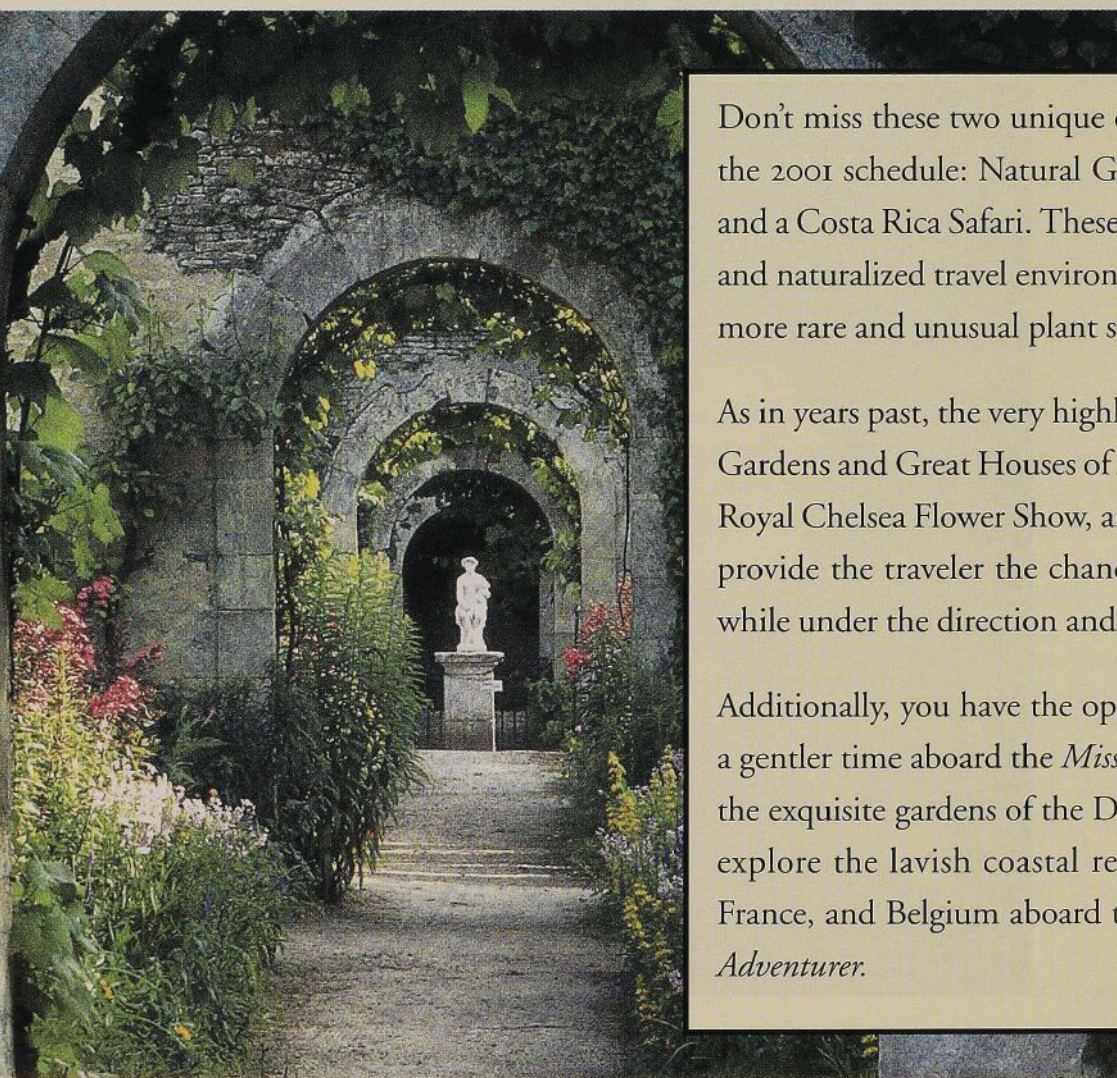




2001

# American Horticultural Society TRAVEL STUDY PROGRAM

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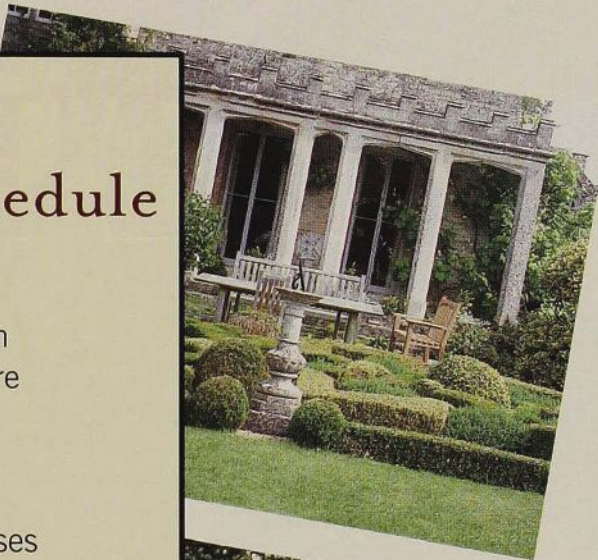
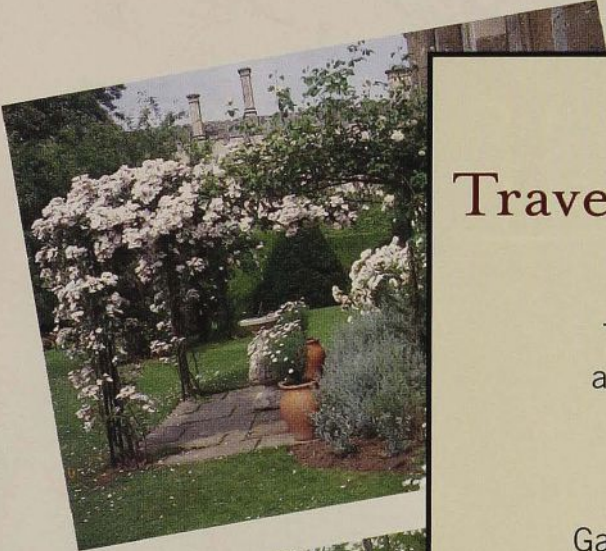


Don't miss these two unique opportunities just added to the 2001 schedule: Natural Gardens of the Canyonlands and a Costa Rica Safari. These tours reflect a more rugged and naturalized travel environment and the chance to see more rare and unusual plant species in the wild.

As in years past, the very highly acclaimed destinations—Gardens and Great Houses of Argentina, London and the Royal Chelsea Flower Show, and the Gardens of China—provide the traveler the chance to see the finest gardens while under the direction and guidance of AHS experts.

Additionally, you have the opportunity to step back into a gentler time aboard the *Mississippi Queen* while touring the exquisite gardens of the Delta region of the South, or explore the lavish coastal regions of Iberia, Portugal, France, and Belgium aboard the luxurious M/V *Clipper Adventurer*.





## 2001 Travel Study Schedule

### **Costa Rica Safari**

Tented Camp Expedition  
and Wilderness Adventure  
February 16–28

### **Estancias**

Gardens of the Great Houses  
and Ranches of Argentina  
March 3–16

### **Gardens of the Mississippi**

Mississippi Queen  
March 14–21

### **Gardens and Monuments of Sicily**

March 16–27

### **Gardens of Coastal Iberia, France and Belgium**

M/V Clipper Adventurer  
May 3–16

### **London and the Royal Chelsea Flower Show**

May 19–26

### **Natural Gardens of the Canyonlands**

Colorado River Raft Adventure  
June 9–17

### **Gardens of Coastal Maine**

July 10–15

### **Gardens of China**

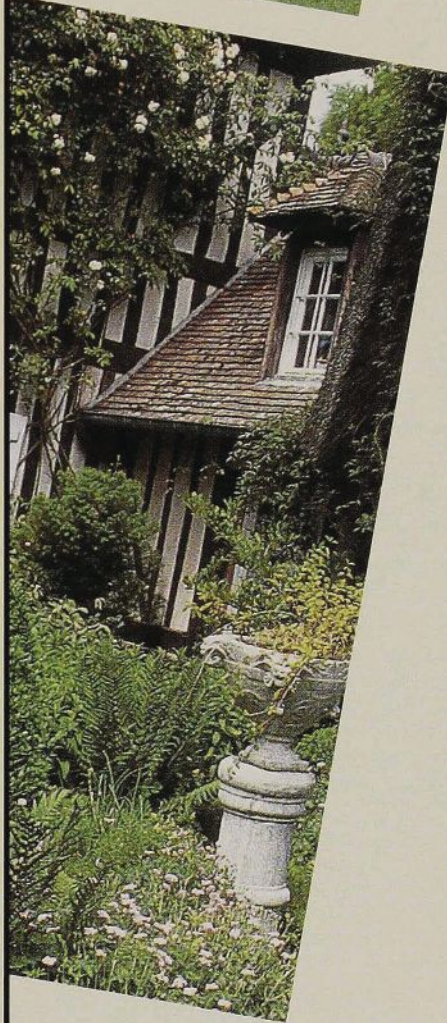
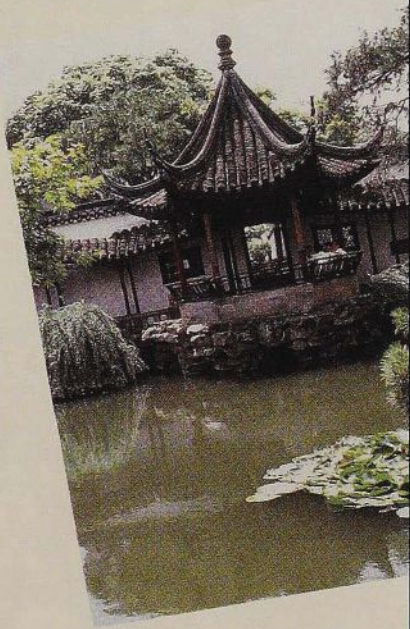
September 3–18

### **Gardens of the Napa Valley**

October (dates to be determined)

### **Gardens of Spain**

November (dates to be determined)



For complete details of the  
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A photograph of a bird perched on a branch of a shrub with red berries, set against a snowy background. The bird is a small, greyish-brown species with a white belly and a long tail. It is facing right, looking towards the camera. The shrub has many thin, dark branches covered with clusters of small, bright red berries. Some of the branches and berries are dusted with white snow. The background is a soft, out-of-focus white, suggesting a snowy landscape.

# BERRIED

Shrubs that retain colorful berries through late fall and winter are a delight to gardeners and wildlife alike.

BY KATHLEEN FISHER

*Ilex verticillata* 'Winter Red'



# TREASURES

ALL GARDENERS ANTICIPATE SPRING. We celebrate winter aconites and crocuses; we eye daffodil shoots for a hint of yellow. Buds on bare woody branches grow plump. Herbaceous perennials we'd forgotten about rear their tender heads.

As a non-gardening youth, I considered these harbingers of spring just the appetizer, the hors d'oeuvre before the bacchanalia of summer. But now a mid-ager living in the Mid-Atlantic, I dread July and August. Take your pick: Hose-dragging drought, or gray skies, drizzle, and nonstop weeds. The air is like chloroform. Mosquitoes lurk.

So I've learned to anticipate autumn. I note that the tiny pink flowers on my beautyberry have been replaced by ball bearings of green and envision them turning to amethyst pearls. I make an informal count of the green knobs on my winterberry holly, hoping for even more scarlet fruits than last season. And I know that the orange berries on my pyracantha will keep mockingbirds darting into my front garden all winter.

There are dozens of other worthy shrubs that bear showy berries in late fall. Whether the berries are persistent—lasting into winter or even spring—depends not only on the species or cultivar, but on the winter weather and the presence of other goodies that may beckon to migrating or resident birds.

You can, if you like, have both beauty and the birds. Here are some shrubs with especially showy berries that will lend visual élan to your garden while giving avian friends something to chirp about, too.

**HOLLIES** Evergreen hollies are synonymous with winter beauty. The contrast between their bright green leaves and the red berries on female plants makes them a decorative addition to any garden, and we've been decking our halls with them for centuries.

But only in recent years have many gardeners come to appreciate our native deciduous hollies.

Among the most popular are the winterberries (*Ilex verticillata*, USDA Zones 4–8, AHS Zones 8–5), which make a knockout hedge or massed clump. Native to our East and growing eight to 10 feet tall, they have small, serrated leaves and dinky white flowers hidden in the leaf axils. The berries begin ripening in late summer, and when the foliage falls, the curtain really comes up. The berries, held snug against the branches, easily last past New Year's and sometimes into spring. Among the many birds that feast on hollies are bobwhites, flickers, phoebes, thrushes, towhees, and vireos.

'Winter Red' is a female selection that won a Pennsylvania Horticultural Society (PHS) Gold Medal in 1995. Other PHS award winners are hybrids of winterberry and finetooth holly (*I. serrata*), a similar species from Japan. 'Harvest Red' has a spreading form while 'Sparkleberry' is more upright. All of these plants need a "male escort" in order to produce berries; the recommended ratio is one male for every four females.

Possumhaw (*I. decidua*, Zones 5–9, 9–5), native to the Mid-Atlantic and Southeast, is another deciduous holly with red berries. 'Warren's Red' is a superior cultivar and can grow to 15 feet or more.

Most hollies will grow in either sun or shade. They prefer acid soil and can be pruned in late winter if you want to harvest some berries for decorations.



*Pyracantha coccinea* 'Mohave'

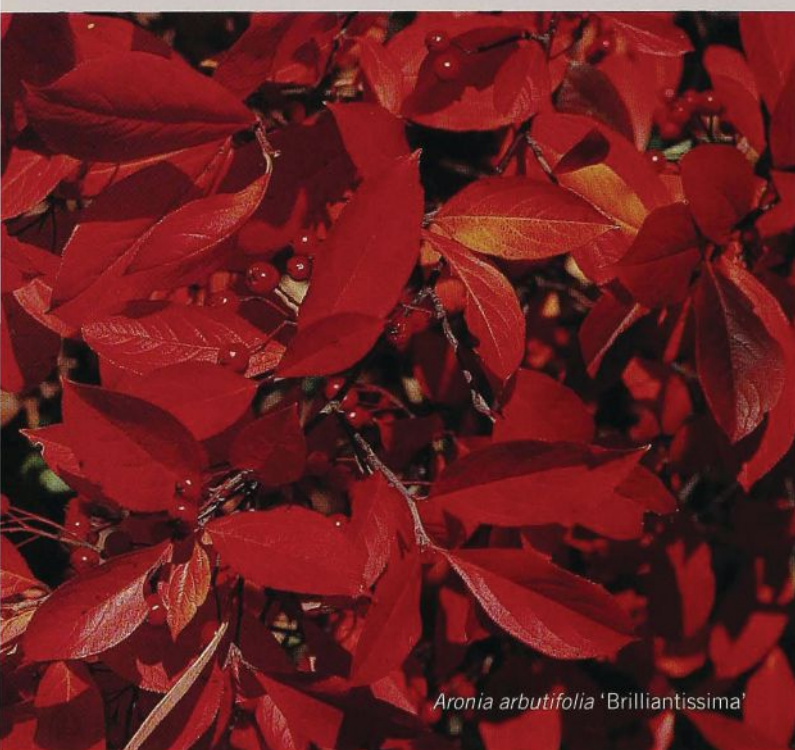
**FIRETHORNS** Like talented thespians, these plants in the rose family can play myriad roles, from fountainlike specimens to bristling security hedges and fanciful espaliers. Scarlet firethorn (*Pyracantha coccinea*, Zones 6–9, 9–3) is really the only species common to gardens, but it has a boatload of cultivars, and there are some worthy hybrid selections. Scarlet firethorn is an evergreen that ranges from six to 18 feet tall. The stiff stems are perfect for birds to perch on, and the long thorns keep predators away. The clusters of small, white, mid- to late-spring flowers can completely cover the stems, but



you'll have to wait until early fall for the real drama—orange-red, pea-sized berries that often last through winter.

Fungal diseases such as scab and fire blight are serious problems for this otherwise useful shrub, so look for cultivars, such as the ones below, that are bred to be tolerant of those scourges and that also have pronounced upright or spreading habits or smaller size. 'Apache' grows only four feet tall, with red, long-lasting berries; 'Fiery Cascade' grows upright, its berries deepen to red, and it is considered more cold tolerant than most. 'Goldrush' (dense) and 'Teton' (upright) both have yellow-orange berries; 'Mohave' has profuse flowers and fruit and an upright habit; 'Pueblo' is wide, with abundant, persistent fruits.

Give firethorns full sun for best fruiting and neutral to acid, well-drained soil. They tolerate drought and resist disease better in dry climates. Pruning can be done at any time of year, but early to mid-spring is best to reduce the loss of flowers and berries.



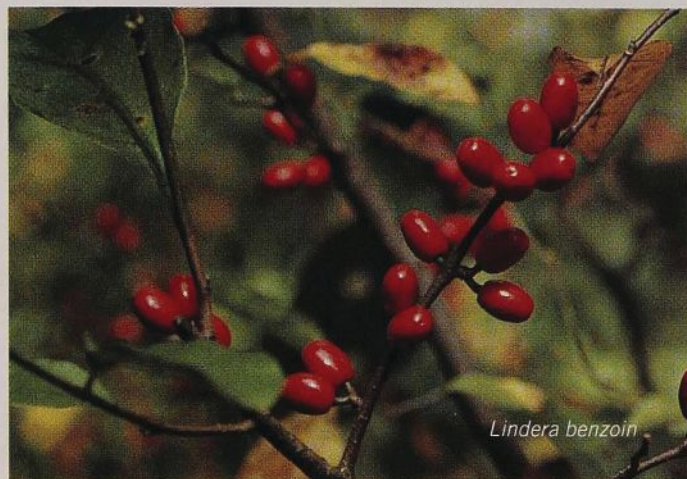
*Aronia arbutifolia* 'Brilliantissima'

**CHOKEBERRIES** There are only two species in this deciduous genus, both native to the eastern United States. Black chokeberry (*Aronia melanocarpa*, Zones 3–8, 8–1) sometimes develops nice red and purple fall foliage, is well suited to small gardens at three to five feet tall, and has dark berries. But it pales in comparison to red chokeberry (*A. arbutifolia*, Zones 4–9, 9–4), especially the cultivar 'Brilliantissima', which offers both stellar fall foliage and bright red berries. Some references claim that birds ignore these berries, but others say they're a favorite of robins, meadowlarks, bluebirds, thrashers, cedar waxwings, and mockingbirds.

I haven't been able to give this debate a firsthand test since I failed to snag a 'Brilliantissima' of my own last spring. For all the good press this plant has received—including a Gold Medal from PHS this year—it still appears to be in short supply. Should you be lucky enough to find one, expect it to get six to eight feet tall and three to five feet wide, tending to sucker and become leggy. It can

also catch some of the diseases (such as leafspot) and attract pests (such as Japanese beetles) that disfigure other members of the rose family. You can control its shape by pruning it back by about a third in spring but, depending on your region's proclivity for these above-mentioned problems, you might want to relegate it to a hedgerow or wildlife glade toward the edge of your property, where its bright berries will still shout out their presence.

Red chokeberry colors best in full sun. A wetland native, it's an excellent choice for pond banks or other moist sites, but it also adapts to drier soils.



*Lindera benzoin*

**SPICEBUSH** A native shrub that grows six to 12 feet tall, spicebush (*Lindera benzoin*, Zones 4–9, 8–1) may be just a bit more understated in all seasons than some others on this list, but I have yet to meet a gardener who has made its acquaintance and doesn't love it. That's because it has something special to offer all year long. In earliest spring, it lights up woodlands with delicate little yellow-green flowers that bloom directly on bare stems. In fall, its foliage reliably turns forsythia-yellow, contrasting smartly with the glowing red fruits, although the latter are so appealing to fall migrants—apparently because of a high fat content—that they don't last much past October. The berries are especially tempting for thrushes, the veery, and eastern kingbirds, and also interest vireos and the great crested flycatcher.

In summer, its leaves are a favored food for the larvae of the spicebush swallowtail butterfly. The leaves also emit a wonderful spicy scent when you brush against them, as will the twigs or berries when crushed.

Spicebush grows naturally along streams and in moist woods, often in chalky soils. It will adapt to drier conditions once established, but appreciates an occasional dose of dolomitic limestone. It will grow denser in full sun; given shade, it develops an appealing open shape that showcases those flowers and berries.

**BEAUTYBERRIES** Once you have seen one of these beauties in full berry, sparkling in the autumn sun, you should have no trouble remembering the common name. The fruits are shiny—almost metallic—and bright purple, bordering on magenta.

American beautyberry (*Callicarpa americana*, Zones 7–10, 9–6), native from Maryland to Florida, grows eight feet tall and six feet wide, but thrives on hard pruning that will keep it about



half that size and better shaped. In late spring or early summer, tiny pink-purple flowers fringed with stamens bloom shyly in the leaf axils. And here the striking berries cluster, beginning in September.

There are also several Asian species, all of which have their fans. *C. bodinieri* var. *giraldii* 'Profusion' (Zones 5-8, 8-3) has arching branches and particularly prolific berries. The graceful purple beautyberry (*C. dichotoma*, Zones 5-8, 8-7)—another PHS medal winner—grows only four to five feet tall with berries jutting above the foliage or, in the north of its range, on bare branches. Japanese beautyberry (*C. japonica*, Zones 5-8, 12-3) is roughly the same size, with arching branches; 'Luxurians' is considered a superior cultivar. There are several white-berried forms, which also have white flowers.

Beautyberries are a snap to grow in sun or shade, although, like most plants, they fruit better with more sun. Northern gardeners usually prune beautyberries near the ground in spring to keep them compact and get rid of any winter dieback.

## SHRUBS FOR WILDLIFE

Here are some more good choices for fruit-bearing shrubs that are worthy of consideration in a shrub border or wildlife sanctuary.

**Sargent crabapple** (*Malus sargentii*, Zones 4-8, 8-1). 10 to 12 feet tall; bright red fruits; self-pollinated; native to Japan.

**Oso berry or Indian plum** (*Oemleria cerasiformis*, Zones 5-9, 9-6). 8 to 15 feet tall; blue-black fruits; needs pollinator plants; native to western North America.

**Silver buffaloberry** (*Shepherdia argentea*, Zones 3-7, 7-1). 10 to 15 feet tall; red fruits; needs pollinator plants; native to north central and western North America.

**Russet buffaloberry** (*Shepherdia canadensis*, Zones 2-6, 6-1). 7 to 8 feet tall; orangy yellow fruits; needs pollinator plants; native to northern North America.

**Snowberry** (*Symphoricarpos albus*, Zones 3-7, 7-1). 2 to 4 feet tall; white fruits; self-pollinated; native to eastern North America.

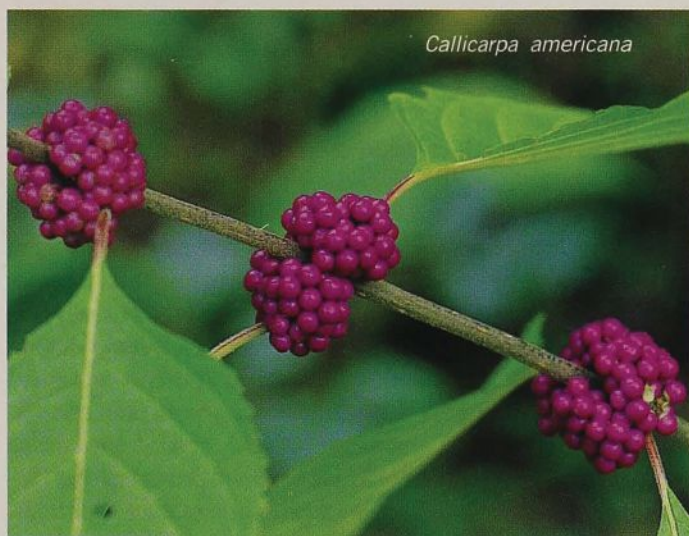
**Current coralberry** (*Symphoricarpos orbiculatus*, Zones 2-7, 7-1). 6 to 8 feet tall; pink-red fruits; self-pollinated; native to eastern and central United States.

holly (*Mahonia aquifolium*, Zones 5-9, 9-3), a native of the Pacific Northwest that has proven well adapted to gardens elsewhere. The species grows to about six feet tall and five feet wide. The leaves are compound, with up to a dozen leaflets on a side, spiny, thick, and often tinged with bronze in spring and fall. Yellow flowers bloom early to mid-spring, with the bold blue berries forming in summer and persisting through winter.

Other *Mahonia* species include Cascades mahonia (*M. nervosa*, Zones 5-7, 7-4), another Northwest native that makes a pretty purple-blue-berried ground cover at 12 to 18 inches; and leatherleaf mahonia (*M. bealei*, Zones 6-8, 8-3), a Chinese species to 12 feet tall, with bright blue berries coated with a white bloom.

Mahonias grow best where they receive part or dappled shade, and if your climate is at all arid, will even appreciate heavy shade. Give

them a spot out of the wind in acid, humusy soil. In spring, when those berries are finally gone, prune off any shoots that have rocketed above the rest of the foliage and spoiled the shape.



*Callicarpa americana*



*Mahonia aquifolium*

**MAHONIAS** There are many garden shrubs with berries of blue. But they're usually small, dark, or hidden in evergreen foliage. As if to make up for the reticence of their brethren, the mahonias almost go to excess, with true blue berries half an inch long, hanging in clusters like grapes. Mahonias, like the related barberries, are among those shrubs whose berries are persistent because they're not birds' favorite repast, but are valued in late winter when the gourmet treats are long gone.

Best known and well deserving of its fame is Oregon grape-



**SUMACS** Our native sumacs are just beginning to get a little more respect. Given their blindingly bright red autumn foliage, heavy swags of late-summer flowers, and fruits that draw dozens of bird species, the only reasonable explanation for their neglect by gardeners is that they are too easy to grow. Especially fine—literally and figuratively—are two cultivars named ‘Laciniata’, each featuring deeply divided leaves.

The first is sometimes identified as a cultivar of smooth sumac (*Rhus glabra*, Zones 3–9, 9–3), other times as a selection of *R. xpulvinata*—a cross between smooth sumac and staghorn sumac (*R. typhina*, Zones 4–8, 8–1). Just to make things additionally confusing, staghorn sumac has its own cultivar called ‘Laciniata’. Both species are handsome in their own right and very similar, except that staghorn sumac has reddish down on its branches, like the velvet on a deer’s horns. Smooth sumac usually grows only 10 to 15 feet tall, while staghorn can reach 20 feet or larger. Both will sucker and form colonies so are best used on large properties, or for naturalizing in masses or shrub borders. Much shorter—at two to six feet—is fragrant sumac (*R. aromatica*, Zones 4–9, 9–4), an eastern native that makes a wonderful cover for steep banks.

The fruits that will give you and the birds pleasure into winter are borne on female plants and take the shape of upright cones

more than six inches long. Those on smooth sumac tend to stay bright red, while those on staghorn sumac fade to brown.

They will tolerate the most adverse conditions, including sea-side banks, as long as they have good drainage.



*Symplocos paniculata*

**SAPPHIREBERRIES** If you’re among those gardeners who go bonkers for blue, please don’t succumb to the turquoise charms of the rambunctious environmental villain called porcelain vine (*Ampelopsis brevipedunculata*). Try instead the sapphireberry (*Symplocos paniculata*, Zones 4–8, 8–4), a deciduous Asian shrub that ranges from 10 to 20 feet tall. The leaves are finely toothed and slightly fuzzy, while the upright branches are furrowed and gray.

Sapphireberry is impressive in bloom, since the star-shaped flowers are highlighted by prominent stamens and flowering is often heavy. But as the common name indicates, the bright blue berries are the feature attraction, ripening in early autumn and usually lasting for several weeks until the birds have had their way with them.

Sapphireberry grows in neutral to acid soil that is moist and well-drained, in sun or light shade. Growing more than one will give you and the birds more fruit. It makes a good informal hedge and shouldn’t need pruning unless you need to control its size. Unfortunately, it is harder to find for sale than other shrubs on this list.

**VIBURNUMS** If hollies offer a feast of berry plants, viburnums are a block-long smorgasbord. There are few that don’t offer fruits to please the human eye or the avian palate. Many of the berries, however, either start out blue-black or quickly fade to that color. After much agonizing, we’ve whittled the list of those with more lasting color down to two: the ‘Erie’ cultivar of linden viburnum (*Viburnum dilatatum*, Zones 5–7, 8–5) and the American cranberry bush viburnum (*V. trilobum*, Zones 2–7, 7–1).



*Rhus aromatica*



## LURING BIRDS TO YOUR GARDEN

If you want to attract avian visitors to your garden, you need to do more than put out feeders. One expert estimates that only about one percent of a bird's nutrition comes from these sources, which are in any case labor intensive to keep filled and sanitary.

Birds eat insects, of course, but these aren't numerous in winter, and herbaceous sources of seeds, such as sun-



Wax myrtle has bright blue berries.

flowers, are helpful only in fall. Your best bet is a diversity of shrubs and small trees that will provide sugary berries, to help feed nestlings in spring; fatty berries, that help fuel fall migrants; and persistent berries that dry and stick around for year-

round residents and the migrants' return in spring.

The berries of our native spicebush, for instance, are high in fat that migrating birds such as warblers need to fuel up for the big trip. Those of sumacs, bayberries, and crabapples are less immediately tempting, but stay on the plant for months to provide food for omnipresent sparrows and finches.

Not all berries are a feast for the human eye. Berries that birds love tend to be small: The better to get my beak around you, my dear. Some berries start out red—nature's way of flashing a "Blueplate Special!" sign for hungry migrants—then fade or shrivel. But pretty much all of them can be an

avian feast when severe weather has eliminated other sources.

For example, the sweet berries of American elder (*Sambucus canadensis*, Zones 4–9, 9–3), a rather raggedy ditch-side denizen native to the eastern United States and Canada, feed almost 40 species, and others prefer this shrub for nesting. The blue elderberry (*S. caerulea*, Zones 5–8, 8–4) is the western counterpart.

The evergreen southern wax myrtle (*Myrica cerifera*, Zones 7–10, 10–5) and the northeast native bayberry (*M. pennsylvanica*, Zones 3–7, 7–1)—which is deciduous in much of its range—have tiny blue-gray fruits only on the female, but some 25 bird species—including bobwhites, wild turkeys, and the king rail—dine on these persistent fruits.

You can bet your bottom birding dollar on a viburnum, and there are dozens to choose from in addition to those already mentioned. Wayfaring tree (*Viburnum lantana*, Zones 4–7, 7–1) has berries that change from yellow to red then black, with all colors in a cluster, and the smooth witherod (*V. nudum*, Zones 5–9, 9–5)—and its highly touted selection 'Winterthur'—have berries that are pink before they turn blue.

Remember that berries evolved on plants as a clever means of persuading birds to disperse their seeds. The beaks and digestive systems of birds even scarify seeds, thus improving germination. Some highly invasive non-native plants—such as bush honeysuckles (*Lonicera* spp.) and Russian and autumn olives (*Elaeagnus angustifolia* and *E. umbellata*)—are especially talented at this and are sometimes promoted as wildlife plants. Be sure to avoid invasive berry plants when planning your bird-friendly landscape.

—K.F.

Another PHS medal winner, 'Erie' is one of the many worthy viburnum cultivars developed by the late great U.S. National Arboretum breeder Donald Egolf. The linden viburnum species is from eastern Asia and averages nine feet tall and six feet wide, but some of the cultivars, including this one, often grow more broad than tall. The foliage is toothed and puckery, and in fall turns yellow, orange, and red. But even before that happens, the four-inch flat clusters of white flowers have given way to intense red berries that turn an unusual coral color and last most of the winter. 'Iroquois' and 'Oneida' are other selections of this species, with red berries, and 'Michael Dodge' has yellow fruit. For best fruiting, plant more than one linden viburnum.

American cranberry bush is native to Canada and the northern United States—from New York to Oregon. It grows eight to 12 feet tall with three-lobed leaves that can turn yellow to reddish purple in fall. The white mid-spring flowers resemble those of a lacecap hydrangea, and the fruits virtually glow on the stems, inspiring the common name. The fruits, which appear in early fall and last into late winter, are edible by humans as well as wildlife. The cultivar 'Wentworth' is notable both for its red autumn leaves and bright red berries.

Viburnums are relatively easy to grow in moist, well-aerated,



*Viburnum trilobum* 'Wentworth'



## Resources

**Bird Gardens: Welcoming Birds to Your Yard** edited by Stephen W. Kress. Brooklyn Botanic Garden 21st Century Gardening Series, Brooklyn, New York, 1998.

**Dirr's Hardy Trees and Shrubs: An Illustrated Encyclopedia** by Michael A. Dirr. Timber Press, Portland, Oregon, 1997.

**Gardening for the Birds** by Thomas G. Barnes. University Press of Kentucky, Lexington, 1999.

**Landscaping for Wildlife in the Pacific Northwest** by Russell Link. University of Washington Press, Seattle, 1999.

## Sources

**Fairweather Gardens**, Greenwich, NJ. (856) 451-6261. Catalog \$4.

*Aronia arbutifolia* 'Brilliantissima'; *Callicarpa bodinieri* var. *giraldii* 'Profusion'; *C. dichotoma*; *Ilex* 'Harvest Red'; *I. decidua* 'Warren's Red'; *I. verticillata* 'Sparkleberry', 'Winter Red'; *Lindera benzoin*; *Mahonia bealei*; *Myrica pensylvanica*; *Sambucus canadensis* 'Aurea'; *Viburnum dilatatum* 'Erie', 'Iroquois', 'Oneida', 'Michael Dodge'; *V. nudum*; *V. nudum* 'Winterthur'.

**Forestfarm**, Williams, OR. (541) 846-7269. [www.forestfarm.com](http://www.forestfarm.com). Catalog \$4.

*Aronia melanocarpa*; *Callicarpa japonica*; *Heteromeles arbutifolia*; *Mahonia aquifolium* and cultivars; *Malus sargentii*; *Myrica cerifera*; *Oemleria cerasiformis*; *Pyracantha* 'Goldrush'; *Rhus aromatica*; *R. glabra* 'Laciniata'; *Sambucus caerulea*; *S. canadensis* cultivars; *Symphoricarpos albus*; *S. orbiculatus*; *Viburnum trilobum* and cultivars.

**Heronswood Nursery Ltd.**, Kingston, WA. (360) 297-4172. [www.heronswood.com](http://www.heronswood.com). Catalog \$8.  
*Ilex* 'Sparkleberry'; *Mahonia nervosa*.

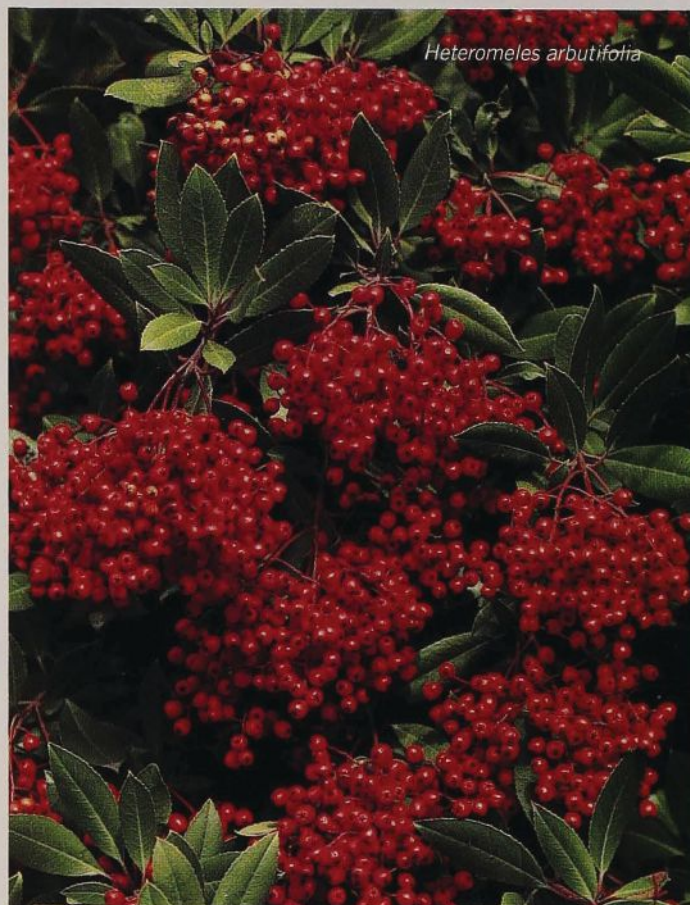
**Louisiana Nursery**, Opelousas, LA. (337) 948-3696. Catalog \$6.

*Callicarpa japonica* 'Luxurians'; *Lycium carolinianum*; *Mahonia bealei*; *Pyracantha* 'Apache', 'Fiery Cascade', 'Pueblo', 'Teton'.

**Mellinger's Inc.**, North Lima, OH. (800) 321-7444. [www.mellingers.com](http://www.mellingers.com). Catalog free.  
*Pyracantha* 'Mohave'.

**Sheffield's Seed Company**, Locke, NY. (315) 497-1058. [www.sheffields.com](http://www.sheffields.com). Catalog free.  
*Callicarpa americana*; *Shepherdia canadensis*; *Symplocos paniculata*.

slightly acid soil in either sun or part shade. Give them some protection from wind and prune only to remove suckers or correct any growth that spoils their natural, relaxed shape.



**TOYON** Formerly classified among the photinias, this shrub in the rose family is now a genus of a single species, *Heteromeles arbutifolia* (Zones 8–10, 12–8). An evergreen native to Southern California, it is usually called toyon, but its red berries have also earned it the common names of California holly and Christmas berry. The latter name is sometimes applied to another good berry and bird plant, *Lycium carolinianum*, native from Florida to Texas.


Toyon usually grows five to 10 feet tall, although it has been known to reach 25 feet. The leaves, like those of hollies, are thick, shiny, and dark green with sharp teeth. In early to midsummer, white flowers bloom in flat terminal clusters. Then in fall the oval berries turn bright orangy red, ready for the birds to snack on between November and January. Occasionally, the berries turn yellow rather than red. Woodpeckers appreciate those of either color, as do bluebirds and hermit thrushes.

Toyon can be hard to transplant, so look for a good-sized specimen with a healthy set of roots. Plant it in well-drained soil in sun or part shade. It makes a good seaside bank plant since it tolerates wind and drought, but will do best with some supplemental water, especially during its first summer.

*A free-lance writer living in Alexandria, Virginia, Kathleen Fisher has just completed a new edition of 'Taylor's Guide to Shrubs, due out from Houghton Mifflin early next year.'*



# NATIVE CONIFERS



North America is home to a wealth of evergreen conifers that offer gardeners year-round color and texture.

**BY SUSAN F. MARTIN**

**M**ANY GARDENERS consider conifers a major investment in terms of both garden space and cost. Although the initial monetary outlay may be a little more than for other plants, nothing compares to the investment's return: the warm scent of pine needles on a summer's day or the whispering of a gentle wind through the branches of a hemlock. A winter's garden alight with the glow of deep green, bright yellow, or soft blue foliage will convince you that native conifers offer much more than the space they occupy in the ground. They are a joy to behold and to grow.

The benefits of growing native plants in our gardens—adaptation to regional soils and climates, a certain degree of pest and disease resistance, heat and cold hardiness, as well as ornamental beauty—apply to other plants as well as conifers. Yet this last group—which I consider the foundation of any American garden—has been largely ignored in most publications about native plants.

## **EASTERN SPECIES**

THE LARGEST AND grandest of the northeastern North American native

Once a source of ship masts for the British Royal Navy, the eastern white pine, towering over 80 feet, is the largest native conifer in the East.





The neat, pyramidal form of *Thuja occidentalis* 'Smaragd', on the right in this mixed conifer and heather garden, provides a bright green accent.

conifers is *Pinus strobus* (USDA Zones 4–9, AHS Zones 9–1), commonly referred to as eastern white pine. In *A Natural History of Trees of Eastern and Central North America*, Donald Culross Peattie writes, “For three hundred years, till well after the turn of the present [20th] century, White Pine was unrivaled as a timber-producing tree. Perhaps no other tree in the world has had so momentous a career. Certainly no other has played so great a role in the life and history of the American people. Fleets were built to its great stands, and railroads bent to them. It created mushroom fortunes, mushroom cities. Earlier it was a torch in the hands of American liberty.”

White pine has a large range extending from Newfoundland to Georgia in the East, and west into Minnesota. A fast-growing pine, it attains heights of over 80 feet with whorls of horizontal to ascending branches extending from a straight trunk. The branches tend to be brittle and are easily broken by ice and during storms, but this can often lead to picturesque specimen plants. It has three- to four-inch-long, bluish green needles clustered in bundles of five. The needles persist on the tree for five to eight years before they are shed.

Eastern white pine grows best in full sun and moist, well-drained soils. Because it grows fast, it has been used for hedges and windbreaks; it makes a great backdrop for shrub borders. It is too large, however, for use in screening smaller yards. And though eastern white pine suffers few serious disease or pest problems, it is very

sensitive to air pollution and is not recommended for highway plantings. The cultivar 'Torulosa' has a somewhat open habit, with twisted, silvery gray needles. It grows 20 feet tall and makes a dramatic specimen.

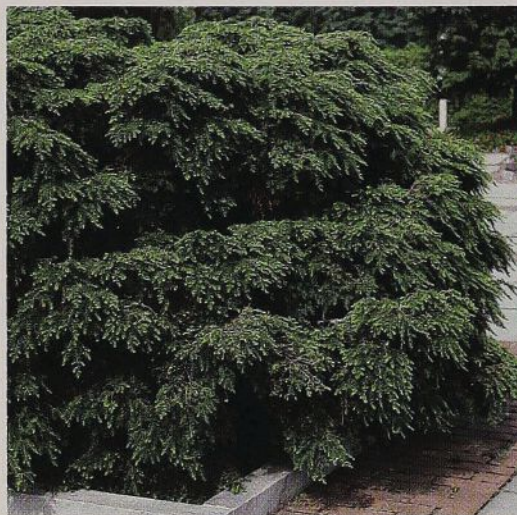
*Thuja occidentalis* (Zones 2–7, 7–1), commonly known as eastern arborvitae or northern white cedar, was probably the first of the native North American (north of Mexico) conifers to be introduced into cultivation in Europe. Records show that it was cultivated in Paris by the middle of the 16th century. It is extremely adaptable. In the wild, it thrives in a wide range of soils throughout the eastern United States. In the garden, it grows best in a moist yet well-drained site, full or filtered sun, and, once established, it can tolerate fairly

strong wind. Although we commonly think of it as a shrub, in the wild this species can attain heights of 50 feet or more. Conversely, harsh environments or thin rocky soils produce groups of very old, stunted trees.

Eastern arborvitae has a pyramidal habit and yellowish green foliage borne in flat, fanlike sprays. The winter color is a dull bronze, so cultivars have been selected for their ability to retain a vivid green color throughout the winter months. One of these is 'Smaragd'—sometimes listed as 'Emerald'. It has a compact, narrowly pyramidal habit and grows to 15 feet; its bright, glossy green foliage is never dulled by winter.

Although deer browse heavily on it, eastern arborvitae selections are some of the most popular native conifers sold by nurseries. They are easy to grow and make fine hedging or specimen plants. Bagworms are sometimes troublesome but can be controlled by removing the “bags” in which the insects’ eggs overwinter, or with applications of the biological insecticide *Bacillus thuringiensis* when the larvae are feeding.

*Tsuga canadensis* (Zones 4–8, 8–1) is a shade-tolerant conifer native to a broad area of the northeastern United States, hence its common name, eastern hemlock. Growing 10 to 12 inches per year, it



The billowy branches of *Tsuga canadensis* 'Bennett', left, create a wide-spreading specimen that reaches only four feet tall. *Juniperus virginiana*, right, develops an open, irregular form with age.



# Compact Native Conifers for Small Spaces

No space to grow full-sized conifers? There are many cultivars of North American natives that will fit into even the smallest gardens. Useful in mixed beds with other evergreen or deciduous shrubs, in combination with herbaceous plants in an alpine garden, as a foundation planting, or as specimens, these selections are generally slow growing and require little pruning.

NAME	HEIGHT (ft.)	REMARKS
<i>Abies concolor</i>		
'Compacta'	10	irregular form, gray foliage
<i>Calocedrus decurrens</i>		
'Compacta'*	6	conical form, bright glossy green foliage
<i>Chamaecyparis lawsoniana</i>		
'Tamariscifolia'*	5	spreading form, delicate gray-green foliage
<i>Juniperus virginiana</i>		
'Grey Owl'	3	wide-spreading, compact habit, silver-gray foliage, blue cones
<i>Picea pungens</i>		
'St. Mary's Broom'	3	dense, compact form to 3' wide, bright powder blue foliage
'Walnut Glen'	10	compact, upright form, soft blue foliage with creamy yellow overtones
<i>Pinus strobus</i>		
'Sea Urchin'	7	slow growing, mounded habit, short blue-green needles
'Winter Gold'	10	irregular form, soft blue-green needles turn lemon yellow in winter
<i>Thuja occidentalis</i>		
'Danica'	4	3' wide, rounded form, bright green foliage
'Degroot's Spire'	10	narrow columnar form, fine-textured foliage
'Sunkist'	12	broadly pyramidal form, bright yellow foliage
<i>Tsuga canadensis</i>		
'Bennett'	4	to 8' wide, with arching branches, gray-green foliage
'Everitt Golden'	5	stiff and ascending branches cloaked with bright yellow needles

\*Currently available only through wholesale sources; ask your local nursery to place a special order.

can reach 70 feet in height, with gracefully drooping branches. It has short, flat, half-inch-long needles that are dark glossy



Tall specimens of California incense cedar lend a formal appearance to a landscape.

green on the upper surface and a pyramidal habit, often with a drooping leader. Many fine dwarf and weeping selections of this variable species exist.

Eastern hemlock survives in many types of soils but prefers cool, north-facing slopes and an understory setting. The woolly adelgid, introduced from Asia in 1924, is its most serious pest; infestations can be devastating. At the National Arboretum in Washington, D.C., researchers are breeding the native species with Asian hemlocks (*T. chinensis* and *T. diversifolia*), which display a natural resistance to the adelgid.

Perhaps best known for its use in cedar chests and closets or as fence posts, the durable *Juniperus virginiana* (Zones 3–9, 9–1) or eastern red cedar also functions in the landscape as a specimen, screen, hedge, or windbreak. A medium-sized tree, it typically grows to 50 feet in height, though very old specimens tower-

ing to 100 feet can be found in eastern Tennessee and Kentucky.

The juvenile leaves are needlelike, about a quarter-inch long, and very sharp and prickly; in contrast, its adult leaves are scalelike, medium to dark green, and are arranged in compacted, four-sided branchlets. Male and female flowers are borne on separate trees; the females produce beautiful, quarter-inch-long glaucous blue cones. Many species of birds, particularly the cedar waxwing, consider the cones a delicacy.

Eastern red cedar is native to the eastern half of the United States and north into Canada, where it is a common sight in abandoned fields or along roadsides. It survives in the poorest of sites, but like most junipers, it loathes shade and is susceptible to a host of fungal diseases if subjected to poorly drained soils or located in a spot that has poor air circulation.



The foliage of *Picea pungens* 'Walnut Glen' is an intriguing blend of light blue with yellow overtones.



Red cedar is an alternate host to several fungus-caused rust diseases. Although these diseases cause minimal damage to cedars, they can be a significant problem for several ornamental and fruit species in the rose family (Rosaceae), including apples; thus, red cedars should not be planted near apple orchards.

Many excellent cultivars of *J. virginiana* have been selected that exhibit an array of color forms and growth habits. 'Emerald Sentinel' is narrowly pyramidal with rich, dark green foliage. This female clone grows to 20 feet tall, produces abundant blue-green cones, and makes a stunning vertical accent.

## WESTERN SPECIES

FROM THE OPPOSITE side of the continent comes the Rocky Mountain juniper, *J. scopulorum* (Zones 3–7, 7–1), indigenous to rocky mountainsides from Alberta to Texas and west to Washington and eastern Oregon. This is a narrow, pyramidal tree that grows 30 to 40 feet tall. Its scalelike leaves vary in color from blue-green to pale green, and its rounded one-third-inch cones are dark blue. Though generally not as tolerant of humidity as the eastern red cedar, it shares similar cultural requirements and does tolerate drought.

A selection of *J. scopulorum* that displays tolerance to both humidity and heavy soil is 'Moonglow', which has a compact and broadly pyramidal habit and grows to about 15 feet. Its foliage is a glorious silvery blue. Two selections that top out at about 20 feet, 'Tolleson's Green Weeping' and 'Tolleson's Blue Weeping', have gracefully drooping branches. The foliage of the first is a soft pale green, while the latter is silvery blue. Both develop into striking garden specimens. Because these cultivars may be hard to find, ask your local nursery to order them from a wholesale source.

Incense cedar, *Calocedrus decurrens* (Zones 6–10, 8–4), was discovered in California near the American River in 1844. In its native range from California north into central Oregon, it grows in cool, moist, well-drained sites, but it is adaptable to other soil and climatic conditions, performing well even in the heat of the southeastern United States.

Incense cedar is a medium-sized, columnar tree that grows six to 10 inches per year, eventually reaching 50 feet tall. It has what I consider the most beautiful foliage of any columnar conifer, sporting its lustrous, dark green scalelike needles in flattened sprays. The columnar habit of this cedar gives it a very for-



The gracefully drooping branches of the Alaska cedar cultivar 'Pendula' add drama to any landscape.

mal appearance in the landscape, and it is therefore best used as a hedge, a backdrop to perennials, or in an allée—a formal hedge lining a path or drive. At Longwood Gardens in Kennett Square, Pennsylvania, a wonderful grove of 70-year-old incense cedars is part of a mature hillside planting of mixed conifers.

Commonly known as the Colorado spruce, *Picea pungens* (Zones 3–8, 8–1) is a very cold-tolerant species native to the central Rocky Mountains. It has a stiff pyramidal habit and characteristic blue-green, one-inch, sharply pointed—*pungens* means "piercing"—needles. This is a slow-growing, heat- and drought-tolerant species that adapts to many different soil types as long as they are well drained. Its mature height in the landscape is typically about 60 feet; however, the national champion is 122 feet tall. Colorado spruce can be susceptible to spider mites and fungal cankers that cause branch and terminal dieback.

Particularly beautiful full-sized cultivars selected for their unique blue colorations include 'Bakeri', 'Hoopsii', 'Koster', 'Mission Blue', 'Moerheim', and 'Thomsen'. These are effectively used as specimens or at the back of a mixed border with plants that have contrasting—dark green or yellow—foliage. 'Baby Blueeyes' is a slow-growing, compact, and symmetrical selection that tops out at 15 feet; its foliage is "baby" blue.

White fir, *Abies concolor* (Zones 3–7, 7–1), is indigenous to western North America, from Mexico to Oregon, Utah, and Idaho. Despite its affinity for arid habitats, this is one of the few native firs



that readily adapts to other parts of the United States and is one of the best firs for the East. The ideal planting site is north facing, with deep, well-drained soil. It has similar cultural requirements and landscape uses as Colorado spruce.

White fir is one of our most beautiful and easily recognizable firs with its two- to three-inch silvery blue, upward-curving needles and light gray bark. Plants are pyramidal in habit and can attain heights of 60 feet or more, although they tend to be moderately slow growing—about 10 inches per year—in cultivation. Although the growth rates and habits among the



*Abies concolor* 'Compacta' has an irregular, compact habit and is well suited to smaller gardens.

many cultivars vary, generally all retain their gorgeous needle color. 'Candicans', a conical selection that grows to 20 feet or so, makes a breathtaking specimen with its long, silvery—nearly white—needles.

In cultivation, *Chamaecyparis lawsoniana* (Zones 5–9, 9–5) is well known as the Lawson false cypress; however, in its native Pacific Northwest, it is commonly referred to as Port Orford cedar. Another moisture-loving conifer from the coastal mountains of northern California and western Oregon, it sports deep green, scalelike foliage on somewhat pendulous, drooping branches. Pyramidal to conical in habit, its trunk is often flaring or buttressed at the base. *C. lawsoniana* often grows to 80 feet in the wild and, although it thrives on moisture-laden slopes, it also grows in drier, sandier soils. A fungal disease known as *Phytophthora* root rot can be a problem when growing this species and its numerous cultivars in clay-based soils.

Many hundreds of cultivars of Lawson cypress were selected in the United Kingdom and Ireland, where the plant is extremely popular. Ironically, only a few of those cultivars have proven successful in the United States. 'Pembury Blue' grows to 25 feet tall, with a broadly conical to pyramidal habit and soft, powdery blue foliage. It is a good choice for a mixed-shrub border.

*C. nootkatensis* (Zones 4–7, 7–1) is also native to the moisture-laden coastal mountains of southern Alaska and the coast of the Pacific Northwest. An amazing study in landscape adaptability,

this species, also known as Alaska cedar or Alaska yellow cedar, grows equally well in the heat and the heavier, clay-based soils of the eastern United States. Its foliage hangs in flattened gray-green sprays on drooping branchlets. When wind rustles through the plant, the drooping branchlets provide delightful movement in the garden. Alaska cedar is loosely pyramidal, growing to 60 feet, and may possess a fluted trunk near the base. In cultivation, Alaska cedar prefers a site

that receives full sun and has moist, well-drained soil. The cultivar 'Pendula' has a gracefully weeping habit that becomes open with age.

## FOR EVERY REASON, EVERY SEASON

THE NATIVE FORESTS of the United States are home to a wealth of extraordinary evergreen conifers, and the sampling of available selections offered here barely scratches the surface. Whether you are looking for an impressive foundation planting, a space-defining hedge, or a year-round specimen, you can find it among this diverse group. And while other plants in your landscape show off during one season or another, native evergreen conifers provide a reassuring year-round presence that anchors any style garden.

*Susan F. Martin is curator of the conifer collections at the U.S. National Arboretum in Washington, D.C.*

## Resources

**American Conifer Society.** (410) 721-6611. [www.conifersociety.org](http://www.conifersociety.org).

**Growing Conifers: Four-Season Plants** edited by R. William Thomas, Susan F. Martin, and Kim Tripp. Brooklyn Botanic Garden, Brooklyn, New York, 1997.

**Manual of Cultivated Conifers** by Gerd Krussmann. Timber Press, Portland, Oregon, 1985.

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**Collector's Nursery**, Battle Ground, WA. (360) 574-3832. [www.collectorsnursery.com](http://www.collectorsnursery.com). Catalog \$2. *Pinus strobus* 'Sea Urchin'; *Thuja occidentalis* 'Degroot's Spire'.

**Fantastic Plants**, Bartlett, TN. (901) 377-1912. [www.fantasticplants.com](http://www.fantasticplants.com). Catalog \$3.

*Thuja occidentalis* 'Danica', 'Smaragd'.

**Forestfarm**, Williams, OR. (541) 846-7269. [www.forestfarm.com](http://www.forestfarm.com). Catalog \$4.

*Abies concolor* and cultivar. 'Candicans'; *Calocedrus decurrens*; *Chamaecyparis lawsoniana*; *Juniperus scopulorum* and cultivar 'Moon-glow'; *J. virginiana*; *Pinus strobus*; *Thuja occidentalis* and cultivar 'Sunkist'.

**Rich's Foxwillow Pines Nursery**, Woodstock, IL. (815) 338-7442. [www.richsfoxwillowpines.com](http://www.richsfoxwillowpines.com). Catalog \$2.

*Abies concolor* 'Candicans' and 'Compacta'; *Picea pungens* 'Baby Blueeyes', 'Bakeri', 'Hoopsii', 'Koster', 'Moerheim', 'St. Mary's Broom', 'Walnut Glen'; *Pinus strobus* 'Winter Gold'; *Tsuga canadensis* 'Bennett', 'Everitt Golden'.

**Roslyn Nursery**, Dix Hills, NY. (516) 643-9347. [www.roslynnursery.com](http://www.roslynnursery.com). Catalog \$3.

*Chamaecyparis lawsoniana* 'Pembury Blue'; *C. nootkatensis* 'Pendula'; *Juniperus virginiana* 'Emerald Sentinel', 'Grey Owl'; *Picea pungens* 'Mission Blue'.



A photograph of a vast field of wildflowers, primarily purple with some yellow ones, stretching towards a range of mountains under a hazy sky. The flowers are in various stages of bloom, and the overall scene is a natural, untamed landscape.

# The Plants of Lewis and Clark

Many of the plants first collected by these trailblazing explorers grace American gardens today.

BY RITA PELCZAR

LED BY CAPTAINS Meriwether Lewis and William Clark, 40-odd rough-and-ready volunteers known as “The Corps of Discovery” crossed the uncharted wilderness of the American West in the early years of the 19th century with the principal aim of finding a water route to the Pacific Ocean. Lewis and Clark were resourceful men who possessed a critical blend of military and frontier experience but precious little training in botany. Yet part of their mission, as outlined by then-President Thomas Jefferson, was to observe plants growing in the regions through which they traveled—especially those not known at that time by the American scientific community—and to return with specimens.



Despite Lewis and Clark's relative botanical inexperience, the plant collections they made on the expedition rank among the most significant in North American history. All of the collections were made between 1804 and 1806, from the area that is now Missouri, Kansas, Iowa, Nebraska, North and South Dakota, Montana, Idaho, Oregon, and Washington—regions previously untapped by botanists. They brought back more than 200 different kinds of plants, including about 80 species new to science and three entirely new genera. The plants represent the flora of vastly different habitats, ranging from prairie to desert, mountain, river valley, and ocean shore. Although other, more botanically trained plant explorers followed their trail west, Lewis and Clark were the first Americans to record the natural diversity and wealth of the region.

The firsthand accounts of their explorations of the West, recorded in detailed journals by the captains and other members of the corps, miraculously survived the hazards of the trail and have fired our national imagination for nearly 200 years. The story has been recounted and interpreted in numerous books, magazines, films, poems, sculptures, and paintings.

Such rich documentation does not, unfortunately, exist for the post-expedition analysis of plants that the explorers brought back (see sidebar, page 43). But by piecing together what has been preserved and considering the value of these plants in our gardens today, we can gain an appreciation for the magnitude of their discoveries.

## THE JOURNEY

JEFFERSON HAD LONG dreamed of an exploration of the territory west of the Mississippi River, and it had been a topic of discussion among members of the

**Opposite:** Purple-flowered camas (*Camassia quamash*) blooms in a meadow in Oregon. In his journal, Lewis noted that a Native American chief made an offering of camas roots to the explorers in 1806.



Lewis's flax (*Linum lewisii*) thrives in dry prairies and meadows.

served him well on the trail.

Jefferson sent Lewis to Philadelphia in the spring of 1803 to acquire supplies and to be tutored in various scientific skills Jefferson considered necessary for the success of the expedition. Lewis took a crash course in botany—including how to preserve plant specimens—from Benjamin Smith Barton, a professor at the University of Pennsylvania. Lewis took a copy of Barton's *Elements of Botany*, the first botanical textbook published in America, with him

on the journey.

After assembling in St. Louis, the expedition departed on May 4, 1804, following the course of the Missouri River, first due west and then northwest. Lewis and Clark divided their responsibilities according to their experience and abilities: Clark was the primary cartographer, while Lewis was the naturalist—he collected nearly all the plant specimens. When traveling by water, Clark, the more experienced riverman, commonly assumed responsibility for the boat, while Lewis walked on shore, recording his observations about the land and collecting whatever specimens he found interesting.

The corps constructed its first winter's quarters at Fort Mandan, near present-day Bismarck, North Dakota. Local Indians acquainted the explorers with a variety of uses for many of the native plants. In the spring of 1805, Lewis and Clark sent Jefferson 67 plant specimens they had collected on their journey up the Missouri River along with their journals, maps, animal specimens, and Indian artifacts collected to date. Jefferson received them in August of the same year, and after examining the plant specimens, sent them to Barton in Philadelphia for study.

The explorers proceeded westward along the Missouri River. They constructed two caches for the specimens collected between Fort Mandan and Camp Fortunate, near what is today Dillon, Montana, which they planned to retrieve on their return. Unfortu-

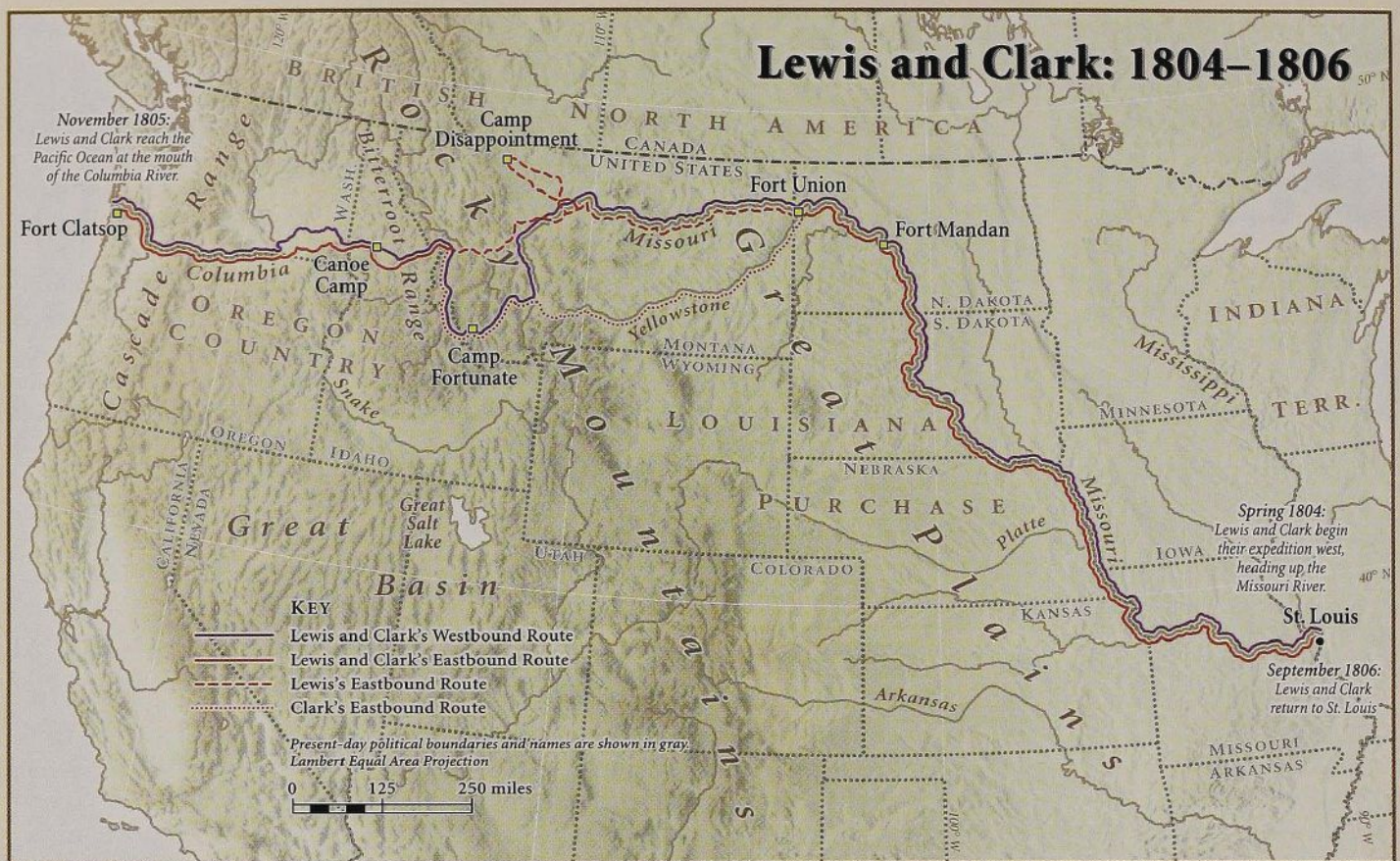
American Philosophical Society—an organization founded in 1743 by Benjamin Franklin—for many years. As president, Jefferson convinced Congress to appropriate the \$2,500 considered necessary to fund the expedition and selected his personal secretary, Meriwether Lewis, to lead it. Lewis, in turn, asked his longtime friend William Clark to serve as co-commander. Both were proven military officers, selected for their frontier experience, knowledge of the woods, and familiarity with Native Americans.



William Clark, left, and Meriwether Lewis as portrayed shortly after completing their historic expedition through the American West.

Although neither captain was a trained botanist, Lewis in particular was a keen observer of nature who had developed an early interest in plants. His mother, Lucy Marks, a respected healer in Albemarle County, Virginia, cultivated and collected plants that she used for ministering to neighbors and relatives. While growing up, Lewis learned to identify indigenous species and became familiar with their medicinal applications. This knowledge





nately, flooding and rot destroyed all but one of these specimens. After a difficult crossing of the Rocky Mountains, they reached the Pacific Ocean in November 1805 and spent the winter of 1805–1806 at Fort Clatsop, quarters they built near present-day Astoria, Oregon. This location proved to be particularly rich in unfamiliar flora.

On their return trip, Lewis and Clark continued their observations and collections, encountering some of the same plants they saw when they were traveling west, but now in a different season. The corps returned to St. Louis on September 23, 1806, laden with artifacts, specimens, journals, and tales that documented their 6,000-mile journey.

## UNFORESEEN OBSTACLES

EVENTS, HOWEVER, conspired to reduce the immediate impact of their botanical discoveries. When the caches along the Missouri River flooded, their preserved specimens and packets of carefully collected seeds were lost, significantly reducing their introductions from that region.

Later explorers found the area rich in new species. Both Thomas Nuttall and John Bradbury ascended the Missouri River in 1811, returning with most of the same species collected by Lewis, and many more as well. “Nuttall had seeds of his species available for sale in Fraser’s Nursery in London, England, by mid-summer of 1813,” explains botanist James Reveal of the Norton-Brown Herbarium at the University of Maryland.

*“It is with great pleasure that, at the request of Governor Lewis, I send you some seeds now inclosed, being part of the Botanical fruits of the journey across the continent.”*

*Thomas Jefferson, March 27, 1807*

Jefferson looked to scholars and friends to assess the garden and scientific value of the specimens and seeds Lewis and Clark brought back, but recorded details of their distribution are sketchy. He offered some of the seeds to a couple of longtime gardening correspondents with whom he exchanged both seed and plant information.

Letters record Jefferson’s intent to provide seeds to André Thouin, director of the French National Garden, and to a Madame de Tessé. Seeds were probably sent to other notable horticulturists of the day, and Jefferson kept a few for his own gardens, including an ear of Mandan corn Lewis had sent him from the Missouri River Valley. Jefferson had long been experimenting with various strains of corn and particularly prized this one.

The majority of the collected seeds were divided between two Philadelphia plantsmen: Bernard M’Mahon, who owned a seed store on Market Street, where some speculate the original plans for the journey were hatched; and William Hamilton, who owned the Woodlands, a 300-acre estate renowned for its plant collections and landscaping. Hamilton, who had assisted Jefferson in his landscape plans for Monticello, received seeds from both the shipment from Fort Mandan and those that returned with the explorers.

But American efforts to introduce plants from the West in the early 19th century were limited. A few new plants from the Lewis and Clark collections were offered commercially, but many were found



to be unsuited to the eastern climate. For the most part, the plants introduced into cultivation, though originally described by Lewis and Clark, were derived from the collections of subsequent explorers. "Into the vacuum came...the Scot collector David Douglas with the Royal Horticultural Society," says Reveal. "It would be Douglas in the mid- to late 1820s who would introduce Lewis and Clark discoveries into the garden." And because definitive classification of the plants was several years coming—and publication of Lewis and Clark's findings was so long delayed—"the true results of Lewis and Clark's expedition were not fully understood until a century later," says Reveal.

Among the many plants Lewis and Clark first described and collected are towering trees, ornamental and fruit-bearing shrubs, herbaceous perennials, annuals, and bulbs. Some became popular in the 19th century. Others have gained favor in more recent years as rock garden specimens or meadow wildflowers. With the resurgence of interest in native plants, it is likely that more may be made available to gardeners in the coming years.

## THE PLANTS

ONE OF THE first plants from the expedition to gain acclaim was Oregon grape holly (*Mahonia aquifolium*, formerly *Berberis aquifolium*), an ornamental

shrub that caused quite a stir when M'Mahon introduced it. Its evergreen habit, bright yellow spring blooms, and grapelike clusters of blue-black berries made it a shrub much sought after for early 19th-century gardens. Hardy from USDA Zones 5 to 9 and heat tolerant in AHS Zones 9 to 3, it grows best in moist, well-drained soil with some shade. It remains popular as a foundation plant and shade garden specimen.

With its thorny young growth, the deciduous Osage orange (*Maclura pomifera*) gained popularity as a barrier hedge soon after it was introduced, and its decay-resistant wood made durable fence posts. A fast grower, it typically attains a height of 20 to 40 feet with an equivalent spread (Zones 5–9, 9–4). At St. Peter's Episcopal Church on Pine Street in Philadelphia, a row of stately osage orange trees nearly 200 years old shades the churchyard. It is widely believed that these trees were grown from seeds or cuttings Lewis gave to Bernard M'Mahon.

The Saskatoon serviceberry (*Amelanchier alnifolia*, Zones 4–9, 8–3), generally develops as a multi-stemmed shrub to 18 feet tall. Its blue-purple berries, which ripen in early summer, were a food source for the Plains Indians, who combined the dried berries with buffalo meat to make pemmican, a food they put by for winter.

The fruit of the snowberry (*Symphoricarpos albus*) is white, and its rounded de-



Estimated to be nearly 200 years old, this osage orange at the American Horticultural Society's headquarters at River Farm may have been a gift from Thomas Jefferson to the family of George Washington, who owned the property in the early 19th century.

## Resources

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**The Lewis and Clark Collections of Vascular Plants: Names, Types, and Comments** by James L. Reveal, Gary E. Moulton, Alfred E. Schuyler. Academy of Natural Sciences of Philadelphia, Pennsylvania, 1999.

**Lewis and Clark Trail Heritage Foundation, Inc.** [www.lewisandclark.org](http://www.lewisandclark.org).

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*Ceanothus sanguineus*, *Ribes aureum*, *Symphoricarpos albus*.

**Las Pilitas Nursery**, Santa Margarita, CA. (805) 438-5992. [www.laspilitas.com](http://www.laspilitas.com). Catalog costs vary. *Amelanchier alnifolia*, *Arctostaphylos uva-ursi*, *Camassia quamash*, *Linum lewisii*, *Mahonia aquifolium*.

**Siskiyou Rare Plant Nursery**, Medford, OR. (541) 772-6846. [www.wave.net/upg/srpn](http://www.wave.net/upg/srpn). Catalog \$3. *Lewisia rediviva*.

**Thompson & Morgan**, Jackson, NJ. (800) 274-7333. [www.thompson-morgan.com](http://www.thompson-morgan.com). Catalog free. *Clarkia pulchella* 'Snowflake'.

**Western Native Seed**, Coaldale, CO. (719) 942-3935. [www.westernnativeseed.com](http://www.westernnativeseed.com). Catalog free. *Cleome serrulata*, *Oenothera caespitosa*, *Sagittaria latifolia*.



Drought-tolerant white tufted evening primrose (*Oenothera caespitosa*), below, was among the native western plants discovered by Lewis and Clark. *Clarkia pulchella*, top right, and *Lewisia rediviva*, bottom right, were named for the explorers by botanist Frederick Pursh in his 1813 volume, *Flora Americae Septentrionalis*.

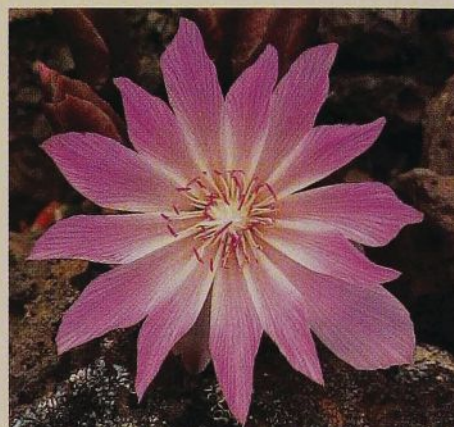


ciduous leaves are a soft, blue-green. It grows three to six feet tall and wide and is particularly valuable in shade gardens. M'Mahon successfully propagated it from seeds Jefferson sent, and by 1834 snowberries were reported to be growing in many gardens around Philadelphia. (Zones 3–7, 7–1.)

Among the bulbous plants Lewis collected was western spring beauty (*Claytonia lanceolata*). Growing from a corm, it produces succulent leaves and three- to eight-inch stems of dark pink flowers in early spring. It is easily naturalized in a woodland or shade garden. (Zones 4–8, 8–3.)

Camas (*Camassia quamash*) grows from a bulb that was a major food source for Native Americans. It grows 12 to 18 inches tall, producing straplike leaves and spikes of violet-blue, star-shaped flowers in spring. It grows best in a moist site—especially in spring—and full sun or part shade. (Zones 4–10, 12–1.)

Herbaceous plants collected on the expedition included Lewis's perennial flax (*Linum lewisii*, also listed as *L. perenne* var. *lewisii*), which is native to dry prairies and mountainsides. It thrives in sites with dry, well-drained soil and full sun and is a good



choice for rock gardens and dry meadows. It bears delicate blue flowers along its wispy 12- to 24-inch stems for several weeks in early summer. (Zones 7–9, 9–7.)

The white tufted evening primrose (*Oenothera caespitosa*) grows best in dry soil and full sun, and it tolerates considerable drought. The deeply toothed leaves are covered with silvery hairs, and white to pink flowers open at night throughout summer. It is a fine choice for xeriphytic borders. (Zones 4–8, 8–1.)

A hardy annual native to prairies and open woodlands, Rocky Mountain bee plant (*Cleome serrulata*) thrives in dry, sandy soil in full sun or part shade. Stems

*"We feasted suptuously on our wild fruit particularly the yellow courant and the deep purple servicebury which I found to be excellent."*

*Meriwether Lewis, August 2, 1805*

rise two to five feet, producing attractive compound leaves and showy clusters of pink, lavender, or white blooms. Rocky Mountain bee plant adds color to flower borders and sunny meadows all summer.

## OTHER PLANTS

The following are other ornamental plants first described or collected by Lewis and Clark.

- Bearberry  
(*Arctostaphylos uva-ursi*)
- Big-leaf maple  
(*Acer macrophyllum*)
- Blue flag (*Iris missouriensis*)
- Buckbrush  
(*Ceanothus sanguineus*)
- Bur oak (*Quercus macrocarpa*)
- Bush penstemon  
(*Penstemon fruticosus*)
- Coast trillium (*Trillium ovatum*)
- Fleabane (*Erigeron compositus*)
- Golden currant (*Ribes aureum*)
- Great purple monkey flower  
(*Mimulus lewisii*)
- Hyacinth of the Columbia plains  
(*Triteleia grandiflora*)
- Pacific madrone  
(*Arbutus menziesii*)
- Ponderosa pine (*Pinus ponderosa*)
- Red columbine  
(*Aquilegia formosa*)
- Rusty leaf (*Menziesia ferruginea*)
- Salal (*Gaultheria shallon*)
- Salmonberry (*Rubus spectabilis*)
- Silver buffaloberry  
(*Shepherdia argentea*)
- Twinberry (*Lonicera involucrata*)
- Wapato (*Sagittaria latifolia*)
- Western mugwort  
(*Artemisia ludoviciana*)
- Western red cedar (*Thuja plicata*)

## NAMESAKES

LEWIS AND CLARK'S achievements are celebrated in the species names—specific epithets—of several plants, including Lewis's perennial flax. But the ultimate tribute came from botanist Frederick Pursh, who in his *Flora Americae Septentrionalis* (see sidebar, facing page) commemorated the explorers in the genus names of two plants new to science.

Bitterroot (*Lewisia rediviva*), a fleshy-rooted perennial from the mountains of the West, attracted lots of attention in



## A Tale of Specimens Lost and Found

**L**ewis and Clark's pioneering expedition was, by all standards, a resounding success. But once back in civilization, their efforts to publish their journals and scientific discoveries were plagued by numerous problems.

In April 1807, Lewis arrived in Philadelphia looking for a publisher for his and Clark's journals. A two-volume narrative of the expedition and a single volume of natural history were planned. Lewis enlisted the help of Benjamin Smith Barton—the University of Pennsylvania botany professor who had earlier given him botany lessons—to put his plant specimens in scientific order. Barton also initially agreed to write or at least assist with the volume on natural history, but failing health and other commitments intervened.

On the recommendation of Bernard M'Mahon, a Philadelphia seed merchant, Lewis hired Barton's associate, the German-born botanist Frederick Pursh, to sort out and prepare drawings of the specimens. A large portion of the collection was left in Pursh's hands when Lewis departed Philadelphia in July 1807.

Lewis died two years later, his narrative unwritten. The War of 1812 further delayed publication of the story of the expedition, and it wasn't until 1814 that Clark was at last able to see the *History of the Expedition Under the Command of Captains Lewis and Clark* in print. The two-volume book, so long delayed, was a financial loss. And the natural history volume remained unwritten.

Pursh retained possession of the specimens Lewis had entrusted to him, taking them—apparently without anyone's authority or knowledge—with him to London in 1811. In 1813, Pursh published *Flora Americae Septentrionalis* (Flora of North America), in which he described 130 plants from the Lewis and Clark expedition and included several illustrations apparently drawn from Lewis's plants. Thus, to

Jefferson's chagrin, the first botanical findings of this great American expedition were published in England by a German botanist!

Pursh's Lewis and Clark specimens were eventually subsumed into the extensive botanical collection of his English employer, A.B. Lambert. Upon Lambert's death in 1842, his collection was auctioned in small lots, at least two of which included Lewis and Clark specimens. One lot, purchased by Edward Tuckerman, an American traveling in England, included 47 of Lewis's specimens. In 1856, Tuckerman presented them to the Academy of Natural Sciences of Philadelphia.

In 1896, Thomas Meehan, a botanist at the academy of Natural Sciences, acquired 179 additional Lewis and Clark specimens—which had been stored at the American Philosophical Society—on permanent loan to the Academy. Eleven Lewis and Clark herbarium specimens were discovered in the 1950s at the Royal Botanic Gardens at Kew, England, where they remain today. One specimen long considered lost from the collection was recently identified at the Charleston Museum, in Charleston, South Carolina. Twenty-three of the expedition's specimens described in Pursh's book are still missing.

Today, the majority of the remaining Lewis and Clark herbarium specimens—227 specimens representing 199 different plant taxa—are housed at the Academy of Natural Sciences. Seventy-five of the sheets in the academy's collection are marked "Type Collection," indicating that it was from these specimens that the original scientific descriptions of the plants were based.

The collection is an irreplaceable piece of history, as acknowledged by a recently awarded "Save America's Treasures" grant to conserve the collection. —R.P.

M'Mahon's seed store, where he exhibited it after coaxing new growth from its shriveled, dry roots. Indians ate the ropy roots fresh or dried, but Lewis found them "bitter and naucious to the pallette [sic]." Bitterroot is widely distributed throughout the West, where it thrives in dry climates with a long, cool growing season. It develops a rosette of leaves in late summer that persist throughout winter. Showy two-inch, rosy pink flowers appear in early spring, after which the plant goes dormant. Its low-growing habit and preference for dry conditions make it a popular rock garden choice. It is particularly abundant in Montana,

where it was designated the state flower in 1895. (Zones 4–7, 8–3.)

*Clarkia* (*Clarkia pulchella*), also called ragged robin, was known only as an herbarium specimen until seeds were collected by Douglas. Native from the Rocky Mountains to the Pacific Northwest, this annual prefers a sandy, well-drained soil and a sunny site, and does not tolerate heat and high humidity. In warm climates, it needs some afternoon shade. Its delicate pink, rose, purple, red, or white blooms are held on two- to three-foot stems, making it a good choice for borders and cut flowers.

Today, many of the plants originally collected or described by Lewis and

Clark have been woven into our landscapes, tamed by cultivation. But it's tempting to think about how they looked through the eyes of those explorers—growing wild on the windswept prairie, creeping among rocks of the Bitterroot Mountains, hugging the steep banks of the wild Missouri or Columbia Rivers. As the 200th anniversary of their journey approaches, perhaps the most fitting tribute to Lewis and Clark would be to add a few more of their discoveries to our gardens.

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





# BOK TOWER GARDENS

This Florida sanctuary for native plants and animals reflects Edward Bok's vision of the synthesis of art and nature.



Above: Edward Bok and friends stroll along a path lined by sand cord grass (*Spartina bakeri*), circa 1927. Top: A pond serves as a reflecting pool for Bok's famous bell tower. The brass door at the base of the tower was created by Philadelphia metalworker Samuel Yellin.

**M**EANDER ALONG the entrance drive to Bok Tower Gardens in Lake Wales, Florida, and you'll catch alluring glimpses of the great Singing Tower above vast orange groves and the tall pines of the sandhill plant community that is characteristic of central Florida. This intrigue is no accident: It is the landscape choreography of Frederick Law Olmsted Jr. "The garden experience begins nearly five miles away," explains David Price, Bok Tower's director of horticulture. Price understands the importance of this experience, as he does so many other aspects, both subtle and spectacular, of Edward W. Bok's unique gift to the American public. Thanks to sensitive management and

staffing, Bok Tower Gardens today retains the original spirit of Bok's vision while staying at the forefront of ecological gardening and landscape stewardship.

A Dutch emigrant who made his fortune as the progressive editor of *Ladies' Home Journal*, Philadelphian Edward William Bok (1863–1930) was originally drawn to central Florida in the early 1920s with the idea of building a winter home in Mountain Lake, a private residential community designed by the Olmsted Brothers firm. But Bok fell in love with the natural beauty of adjacent Iron Mountain, the highest point on Florida's central ridge yet, at 298 feet above sea level, little more than a hill.

article and photographs by Rick Darke



Inspired by his grandmother's advice to make the world "a bit better or more beautiful because you have lived in it," Bok purchased the land, engaged the design services of Olmsted, and set out to create a retreat "of natural beauty, a refuge for the bird, and a place for the student of southern plant and bird life." Aiming for more than a mere nature preserve, Bok wanted his project to fill people's souls with "the quiet, the repose, the influence of the beautiful." He named it Mountain Lake Sanctuary.

Olmsted employed regionally native flora as a basis for the landscape, enhancing it most notably with a magnificent grove of live oaks (*Quercus virginiana*). Today, these oaks have become a powerfully enveloping presence, naturally draped with Spanish moss (*Tillandsia usneoides*), another emblem of southern plant life. Motivated to create a contemplative landscape, Olmsted focused not so much on specific plants as on the transitions between spaces. He designed pathways offering myriad opportunities for exploration and discovery, moving gracefully between light and shadow and from intimate space to broad vista.

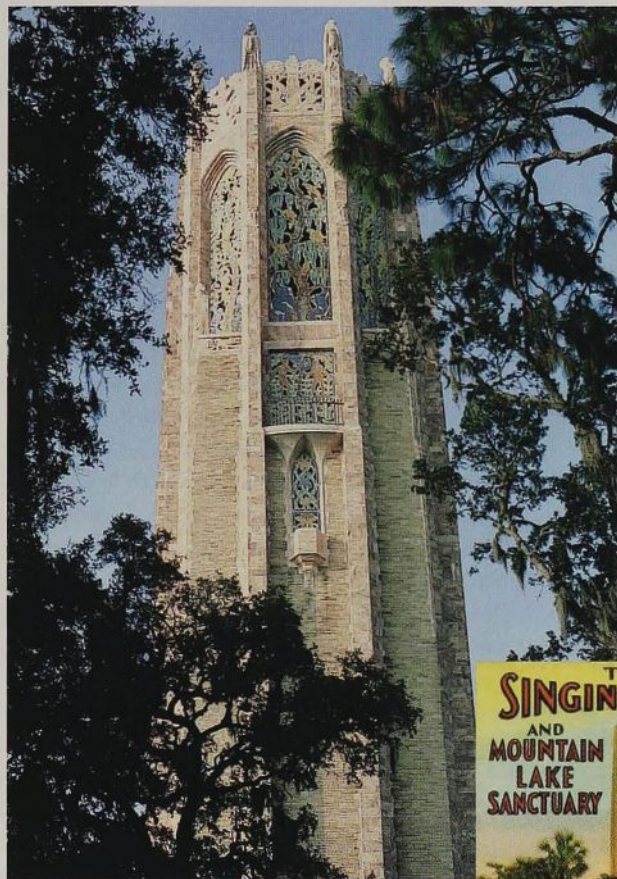
Olmsted also introduced two ponds to encourage wood ducks and teal to take up residence. The ponds were designed with shallow areas to accommodate wading birds. To further cater to avian visitors, more than 50 birdbaths were integrated into the plantings.

## ARTS AND CRAFTS INFLUENCE

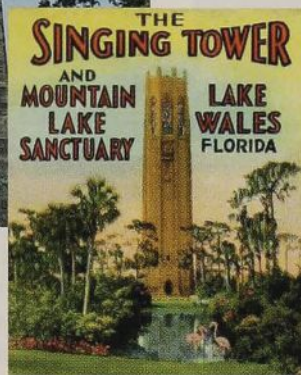
IN TURN-OF-THE-CENTURY Philadelphia, Bok had become acquainted with many leaders in the then-flourishing Arts and Crafts Movement. Like English visionary William Morris, master craftsman Gustav Stickley, and so many others involved with

the movement, Bok believed in inviting a unity of the arts into everyday life. Recalling the sound of carillons from his childhood in the Netherlands, Bok decided to build a great bell tower at the sanctuary and brought some of the country's most skilled artists and craftsmen together to make it a reality.

Positioned by Olmsted near the summit of the sanctuary, the tower rises 205



**Above:** Tile murals of stylized plants and animals embellish Bok's bell tower. **Right:** The gardens' original name, Mountain Lake Sanctuary, is shown on this postcard from the 1930s.



feet above the upper pond, which serves as a reflecting pool. In keeping with Arts and Crafts ideals, which promoted the use of local materials whenever practical, and with the southern focus of the sanctuary, the tower is built of pink and gray Georgia marble and tan Florida coquina stone.

Designed in an updated Gothic style by architect Milton Medary, the tower is most remarkable for the myriad plant and animal motifs incorporated into its structure and surfaces. These tell the story, as Bok put it, of Florida's "life and legend." Sculptor Lee Lawrie fashioned innumer-

able birds from the marble, including pelicans, herons, geese, and swans.

The tower's 57 bronze bells—which range in weight from 11 pounds to 11 tons—were cast in England. Huge grilles nearly 35 feet high allow the carillon's music to flow out through the sanctuary. The main door at the base of the tower was crafted in brass by Philadelphia metalworker Samuel Yellin. (For more on Yellin and the Enfield Pottery and Tile Works, described below, see page 46.) Individual panels of the door, which tells the story of creation, are dedicated to various aspects of nature. A prominent panel depicting a great spreading tree ties the tower directly to Olmsted's nearby grove of live oaks.

This theme is continued in a breathtaking tile mural that forms the floor of the "Founder's Room" inside the tower's base. In abstract, the mural, commissioned from the Enfield Pottery and Tile Works, illustrates spreading branches of the native live oak, hung with Spanish moss. Within the branches, individual tiles portray Florida animals, including birds, squirrels, snakes, and turtles. At the very center of the mural, a six-pointed star symbolizing life is overlaid on a stylized image of the native lotus (*Nelumbo lutea*), which was revered by Florida's Seminole Indians.

The "Singing Tower," as it became known, was dedicated in 1929 by President Calvin Coolidge during a ceremony in which the tower and Mountain Lake Sanctuary were formally presented to the American people. Bok died the following year, but his gift—which was renamed Bok Tower Gardens in 1987—has matured into a unique and vital institution combining the very best of art and ecology.

## EVOLUTION OF THE GARDENS

THE OLMSTED PLAN remains largely intact, and the mature plantings now create an atmosphere that is more compelling than ever. The garden has its colorful seasons, most memorably when azaleas bloom in vast sweeps among the



understory plantings; however, it is always a magnificent study in greens. "Texture is the really the backbone of the garden," notes Price.

Generous seating positioned throughout the gardens allows visitors to claim a bit of space to follow their own desires, whether they be reading, conversing, watching the sunlight play through the oaks, or observing the antics of squirrels and other friendly fauna that call the garden home.

Children, in particular, enjoy the prevalence of animals. Frequently appearing in the gardens' guest register are comments such as "peaceful," "contemplative," "a true sanctuary," "spiritual," and, most likely from the junior set, "a really cool place." The pond on the north end of the garden has evolved into a place specially intended for observing wildlife. A simple board-and-batten cypress building allows visitors to watch various birds and alligators without being seen themselves. Called "Window by the Pond," it is popular with children of all ages.

The Audubon Society lists the city of Lake Wales as a superb birding locale, and Bok Tower shares this reputation. Price terms the main gardens today "a nature preserve in the loosest sense," including plantings for animals and birds, though not all are strictly native. This, too, reflects some of Bok's initial interests. Though flamingos occur in southern Florida, they are rare. Bok introduced them from Cuba, but they eventually proved too difficult to manage in good health, requiring a diet of shrimp and fish not readily available in the sanctuary. They survive today only on colorful period postcards of the Singing Tower.



## Bok's Philadelphia Arts and Crafts Connection

Edward Bok's interest in the arts brought him into contact with some of the leading artists and craftsmen in the Philadelphia area, including Samuel Yellin (1885–1940), who is widely regarded as America's finest artist in metal. A native of Poland, Yellin moved to Philadelphia in 1906 and opened his first metalworking business in 1909. The artistic originality and deft craftsmanship that marked his work soon won him commissions across the country.

Yellin's ironwork for Bok includes gates, grilles, lanterns, and stairs in and around the tower. He worked less commonly in brass, but his magnificent door for the Singing Tower is certainly among his masterpieces. Yellin's tradition of producing handcrafted, one-of-a-kind works of art in metal for architecture and gardens is being carried on by his granddaughter, Clare Yellin, who manages Samuel Yellin Metalworkers in Bryn Mawr, Pennsylvania.

Bok commissioned many of the tiles at Mountain Lake Sanctuary from the Enfield Pottery and Tile Works, Inc., of Enfield, Pennsylvania, which was once regarded as one of America's finest tile makers. Though Enfield ceased production early in the 20th century, other period tile works are enjoying a renaissance and still others have started recently. Henry Chapman Mercer's Moravian Pottery and Tileworks in Doylestown, Pennsylvania, is again in production as a working museum, making tiles from Mercer's original molds. Pewabic Pottery of Detroit, Michigan, and Fulper Tile of Yardley, Pennsylvania, are also in production again with a range of ceramic work in natural colors and glazes. Motawi Tileworks of Ann Arbor, Michigan, and The Arts & Clay Company of Woodstock, New York, are among the many fine new tile works producing ceramics in the Arts and Crafts tradition.

—R.D.



**An elaborate Enfield tile mural graces the base of Bok's bell tower.**

Contact information for the tile and metalworks listed above can be found on the November/December 2000 page of *The American Gardener* section of the AHS Web site ([www.ahs.org](http://www.ahs.org)).

## PLANT COMMUNITIES PRESERVED

OCCUPYING A large northeastern portion of the grounds, the Pine Ridge Preserve is scientifically managed to protect the native longleaf pine–turkey oak habitat occurring there. This sand-hill plant community is typified by an open canopy of longleaf pine (*Pinus palustris*) and a dense ground cover of perennial grasses, notably wiregrass (*Aristida stricta*). Comprising mostly sun-loving plants, this community is dependent on periodic fires for its long-term survival.

**Sand cord grass and other Florida native plants line the entrance to the visitor's center.**

Working with the Nature Conservancy, the Bok Tower Gardens staff has developed a controlled-burn program, setting fire to different areas approximately every three years on rotation to maintain optimum habitat conditions.

The native fauna is particularly rich in the preserve areas and includes fox, bobcat, wild turkey, and many owls. The conservation ethic even extends to native snakes, in particular the indigo snake, which is endangered due to both habitat loss and overcollection as pets.

The gardens is also a participating institution of the Center for Plant Conservation, working to protect native species from extinction through the Endangered Plant Species Program, begun in 1986. As conservation activities have grown, new staff positions have been added, including a conservation manager, who coordi-





Originally planted by Frederick Law Olmsted Jr., these Spanish moss-draped live oaks are emblematic of Bok Tower Gardens' place in the southern landscape.

nates activities with other agencies throughout the state, and a land steward responsible for controlling invasive exotics and maintaining the native plant and animal communities.

Bok Tower Gardens is located in Polk County, which has long been Florida's prime citrus-growing region. For decades, the gardens' acreage has been surrounded by groves, but devastating freezes in recent years have increased the likelihood of the land's residential or commercial development. The gardens has initiated a viewshed project, intended to protect the visual integrity of the Olmsted drive and other historic vistas. As they've become available, surrounding parcels of land have been purchased and replanted with longleaf pine and wiregrass, restoring more of the native sandhill community while protecting the views and local ambience.

Plantings at the new visitor center, completed in 1997, are designed to evoke

native Florida by making extensive and imaginative use of native species. Huge, fine-textured clumps of sand cord grass (*Spartina bakeri*) flank the main walks, shimmering in the strong Florida sunlight and contrasting with the bold form of saw palmetto (*Serenoa repens*) and coontie (*Zamia pumila*), a native cycad that is now threatened in Florida. Though sand cord grass is only recently becoming known and readily available to American gardeners, Olmsted planted it along then-sunny paths in Mountain Lake Sanctuary in the 1920s. Other Florida natives planted at the visitor center include scrub palmetto (*Sabal minor*) and pygmy fringe tree (*Chionanthus pygmaeus*).

The visitor center also continues the tradition of incorporating nature-based art in the garden's landscapes. Florida artist Robin Rodgers was commissioned to create tiles depicting native ecosystems of Florida, including plants and animals of the sandhill community. Approximately 250 tiles will eventually be installed in the front entrance courtyard.

## PINWOOD

IN ADDITION TO the theme of natural beauty that is at the core of its mission, Bok Tower Gardens also interprets something of the human history of early 20th-century Florida through programs and tours at Pinewood house and gardens. Built in 1931 as part of the Mountain Lake community, Pinewood was originally the winter home of Charles Austin Buck, vice president of

Bethlehem Steel in Bethlehem, Pennsylvania. Buck engaged landscape architect William Lyman Phillips, then with the Olmsted Brothers firm, to design the gardens, which include a superb walled garden and moongate that are visible from one of the upstairs bedrooms. The property, which borders Bok Tower Gardens, remained in private hands until the gardens acquired it in 1970.

Pinewood is a superb example of harmonious design of house and garden, and the landscape is certainly one of Phillips' masterpieces. Pinewood allows visitors a glimpse of what it is like to live amid a landscape dedicated to music, to the native fauna, and to nuanced beauty such as Spanish moss sidelit by the setting sun.

Can a garden be a sanctuary? Can its art enhance and protect the connections between human endeavor and the greater living community? Edward Bok believed so, and by all accounts, Bok Tower Gar-



A walled garden designed by William Lyman Phillips is among the highlights at Pinewood house and gardens.

dens is both the realization of Bok's dream and a true inspiration for modern gardeners who seek a synthesis of art and nature in their own landscape.

*Rick Darke lives in Landenberg, Pennsylvania. His most recent book is In Harmony with Nature: Lessons from the Arts & Crafts Garden, published by Friedman/Fairfax.*

## VISITING BOK TOWER GARDENS

Bok Tower Gardens is open from 8 a.m. to 6 p.m. year-round. Admission is \$6 for adults and \$2 for children ages five to 12. Memberships are available. For more information, including details of seasonal special events at the gardens and the adjoining Pinewood Estate, contact the gardens' staff at Bok Tower Gardens, 1151 Tower Boulevard, Lake Wales, FL 33853-3412. (863) 676-1408. [www.boktower.org](http://www.boktower.org).



# Renewal Pruning for English Boxwood

*Gardeners can add years to the life of these garden classics by using proper pruning techniques.*

BY MARY YEE

AT THIS TIME OF THE YEAR boxwood (*Buxus* spp.) often comes to mind in seasonal decorations or greeting-card images of formal gardens under a layer of fresh snow. Now is also an ideal time to evaluate the boxwoods in your garden and give them a little extra care so that you can enjoy them for many more winters to come.

There are some 97 species of boxwoods with varying growth habits and characteristics, but gardeners are most familiar with common boxwood (*Buxus sempervirens*) and its many cultivars, especially ‘Suffruticosa’, commonly known as English boxwood. The latter is the one often grown in neat mounds and as clipped hedges. English boxwood is reliably hardy in USDA Zones 6 to 8 and heat tolerant in AHS Zones 9 to 6.

## PRUNING REQUIRED

THE PRINCIPAL growing requirements for all boxwoods are a location with well-drained soil that has a pH near neutral, part shade, and some protection from drying winds in winter. Assuming that you’ve met these requirements—and that you’re providing appropriate amounts of water and fertilizer—the most frequent cause of boxwood failure is poor, or nonexistent, pruning practices. “Many gardeners are afraid if they do anything, they may cause the demise of what are considered finicky plants,” says Ron Rubin, a certified arborist with The Care of Trees, a Virginia-based company that helps maintain the trees at the American Horticultural Society’s headquarters at River Farm. “But when gardeners do prune boxwoods, they usually prune for shape—because they’re encroaching on the walkway or patio—not for overall health.”

Lynn Batdorf, curator of boxwoods and perennials at the U.S. National Arboretum in Washington, D.C., agrees: “English boxwood has gotten a bum rap because people don’t understand its cultural requirements.” He says he gets six to 10 calls every week from distressed homeowners wanting to know why their box-

woods are dying. He tells them, “The single most important reason for boxwood death is not thinning their branches.”

Thinning—the partial removal of selected branches—opens up a plant’s structure and encourages healthier growth. (See box on facing page.)

As a result of English boxwood’s traditional use as hedges and borders in highly formal gardens, many gardeners think shearing—the wholesale cutting back of the branch tips—is part of boxwood care. But unless you have a formal garden where clipped growth is required, letting plants grow more naturally will not only mean less work for you but better health for the boxwood.

Shearing removes large amounts of a plant’s new growth and tears up the leaves left on its branches, making the plant stressed and susceptible to a host of problems. Although plenty of newer growth will emerge at the branch tips, the lower parts of the branches eventually become bare and weak, making them vulnerable to breaking under a load of snow or ice. Dense top growth also impedes air circulation through the plant, setting up a favorable environment for fungal diseases such as leaf spot and twig blight. Even if you don’t shear, some boxwoods develop weak branches and heavy top growth if maintenance pruning is neglected.



## HOW TO THIN AN ENGLISH BOXWOOD

The grounds and gardens at River Farm, headquarters of the American Horticultural Society, contain many specimens of common and English boxwood, some over 100 years old. In the boxwood shown below, arborist Ron Rubin removed 10 to 15 percent of the branches in order to open up its structure. After the pruning, there are open spaces in the shrub that permit freer airflow and penetration of light. Done properly, as here, thinning does not drastically alter a plant's appearance.

And remember to always use a bypass pruner—the kind with a hooked blade that severs with scissors action—for the cleanest cuts. Anvil pruners, which consist of a cutting blade that chop down on a wide blade, often crush stems, leaving ragged edges that invite disease. —M.Y.



PHOTOGRAPHS BY DAVID HATHCOX

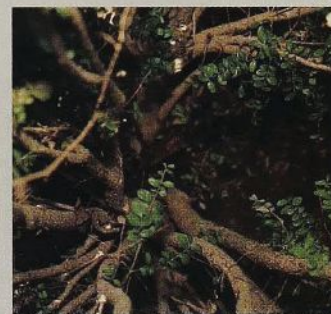
1. Before you begin pruning, assess your boxwood's overall density of growth. You'll want to thin the shrub so that you can see through it from all perspectives, so select branches for cutting that will result in well-distributed spaces. Here Rubin is removing some lower branches to improve airflow at ground level.



2. Remove the top six to eight inches on the selected branch above a growth point—the point where it meets another branch. Hold the cutting blade of the tool against the branch to ensure the cleanest cut and to avoid leaving a sizable stump that will die and promote disease.



3. Proper thinning will promote the growth of new leaves on the inner branches—shown here on the shrub with its branches parted—by allowing more sunlight and fresh air to penetrate. The result: a stronger, healthier plant come next growing season.



### NEVER TOO LATE TO BEGIN

THE EFFECTS OF PROLONGED neglect aren't always immediate. Sometimes newly planted and apparently healthy shrubs seem to die overnight despite being given the proper environment, but the failure is often due to longterm improper care. "Some nurseries that grow and sell boxwoods don't fully understand the importance of thinning," Batdorf explains, so the consumer ends up with stressed plants that cannot survive being transplanted.

An unpruned shrub may live for years or even decades, but its lifespan will have been greatly shortened. Considering that boxwoods can live more than 200 years, beginning a regular maintenance program now is an easy way to help ensure that your boxwoods last at least your lifetime.

Rubin stresses that thinning is especially beneficial for boxwoods that are sheared regularly for aesthetic reasons. "It offsets the stress of shearing by opening the plant up to allow for interior growth," he says. "This provides the plant with a larger amount of leaf surface for photosynthesis."

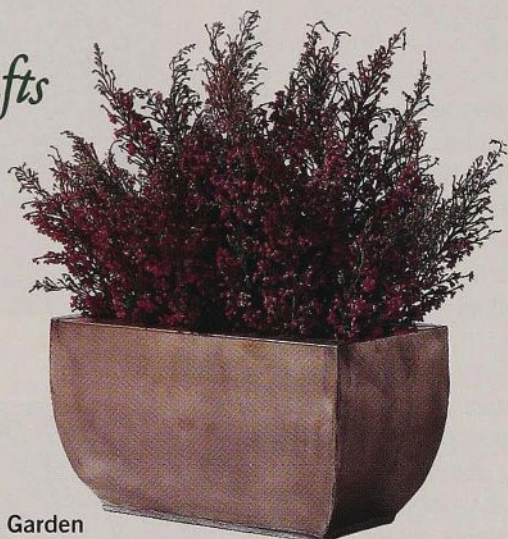
Batdorf suggests thinning English boxwood once a year or every other year to maintain an open structure. Early winter—when the shrubs are not putting out new top growth—is the best time to do this. And, he adds, since the best time to prune boxwood coincides with the traditional winter holidays, you can use the cuttings in fresh flower arrangements or to make festive wreaths.

Mary Yee is managing editor and designer of *The American Gardener*.



# Gifts for the Gardener

Holiday Gifts



## Heather Garden

A smooth copper trough filled with two deep pink specimens of *Erica gracilis* is perfect for catching rays on a bright windowsill. Come spring, transplant them to your garden. The trough measures 6½ inches wide by 12 inches long by 6¾ inches high. \$79 plus shipping.

**Smith & Hawken**, P.O. Box 431, Milwaukee, WI 53201-0431. (800) 776-3336. [www.smithandhawken.com](http://www.smithandhawken.com).



## Frog Drinking the Rain Gauge

Leave the measurement of precipitation in your garden in the capable throat of this thirsty amphibious friend. Made to withstand the elements, he's sculpted from a durable combination of concrete and limestone aggregate that will pick up a natural patina over time. Measures 4 by 5 inches. \$39 plus shipping.

[www.garden.com](http://www.garden.com), or call (800) 466-8142.

Garden Gifts



## APS Starter Kit 2000

A great gift for gardeners of all experience levels, Gardener's Supply's exclusive APS (Accelerated Propagation System) kit comes with everything needed to start vigorous plants from seed. Includes one APS-40 and one APS-24 growing system along with two larger trays for transplanting, nine quarts of germination mix, seedling markers, a seed sower, and a jar of fertilizer/nutrient supplement. \$29.95 plus shipping.

**Gardener's Supply Co.**, 128 Intervale Road, Burlington, VT 05401. (800) 863-1700. [www.gardeners.com](http://www.gardeners.com).



## Seed Keeper

Keep that collection of harvested seeds and partially-used seed packets neatly organized and accounted for with this attractive binder, which includes six plastic, resealable sleeves, a pack of 20 reusable seed envelopes, and a seed-saving information sheet. Ideal for holding seeds in and moisture out, the plastic sleeves have room for 36 seed envelopes. Extra sleeves and seed envelopes are also available. \$19.95 plus shipping.

**Lee Valley Tools Ltd.**, P.O. Box 1780, Ogdensburg, NY 13669. (800) 871-8158. [www.leevalley.com](http://www.leevalley.com).

Holiday Gifts for Gardeners



## Garden Gifts



### Felco Pruners

These classic, Swiss-made pruners make a welcome and useful gift for the gardeners on your list—at the holidays or any time of the year. Made from top-quality steel, their adjustable blades cut superbly and include smart features such as a sap groove and a wire-cutting notch. Lee Valley offers several models in the Felco line at reasonable prices, including those made for left- and right-handers and a compact size ideal for small hands. Convenient leather holsters—in either the clip-on or belt model—complete the package. Prices range from \$36.50 to \$46.50 plus shipping; holsters are an additional \$7.50.

**Lee Valley Tools Ltd.**, P.O. Box 1780, Ogdensburg, NY 13669. (800) 871-8158.  
[www.leevalley.com](http://www.leevalley.com).

### Microwave Flower Press

Preserve your favorite blossoms, ferns, and colorful autumn leaves quickly and easily with this microwaveable flower press—a fun gift for craft-loving gardeners of all ages. Just sandwich plant material between the absorbent felt pads and terra cotta tiles, then microwave to dry. The set includes a pair of 6½-inch-square tiles, pads, and liner sheets, plus complete instructions. \$17.95 plus shipping; sets of two replacement pads are also available for \$6 each.

**Gardener's Supply Co.**, 128 Intervale Road, Burlington, VT 05401. (800) 863-1700.  
[www.gardeners.com](http://www.gardeners.com).

### Critter Paper Clips

Made from sturdy, chrome-plated steel wire, these whimsical critter clips will help you keep everything together while adding a touch of the great outdoors to ho-hum files and documents. Each clip is hand-tied by the women of Xiao Shan county in China's Zhejiang province, and a portion of all profits go toward childcare at the local hospital. \$12 plus shipping for a set of six clips—two dragonflies, two spiders, and two butterflies.

**www.garden.com**, or call  
(800) 466-8142.



### Orchid Ornament

The American Orchid Society (AOS) offers its first limited-edition holiday ornament this season, featuring *Lycaste skinneri* 'Kate'. Designed exclusively for AOS by noted botanical artist Carol Woodin, the three-inch ornaments are made from cold-cast porcelain and are individually hand-painted, signed, and numbered by the artist. Priced at \$29.95 each, which includes shipping and handling; Florida residents must add 6% sales tax, plus your county's surcharge, if applicable. Order on-line at the AOS Web site, <http://orchidweb.org>, or send a check or money order to:

**American Orchid Society**, Dept. ORN/00, S. Olive Avenue, West Palm Beach, FL 33405.



## Holiday Gifts





# Poinsettias for the Holidays

*These newer poinsettia selections are available at retail outlets throughout the country. If you can't find the variety you're looking for in your area, contact the company or ask your local nursery to order them for you.*



'Winter Rose Dark Red', above;  
'Heirloom Peach', right

## 'Winter Rose' and 'Heirloom'

*'Winter Rose'.* Winner of the Society of American Florists' 1999 new variety competition, this late-season variety has an unusual bract shape reminiscent of a large, open rose blossom. Comes in four different colored varieties: Dark Red, Pink, Jingle Bells, and White.

*'Heirloom'.* A mid-season variety that features decorator colors with silver-gray foliage and white variegation. Available in Peach, Red, and Pink.



**Paul Ecke Ranch**, P.O. Box 230488,  
Encinitas, CA 92023.  
(800) 468-3253. [www.ecke.com](http://www.ecke.com).

## 'Festival Rose' and 'Red Angel'

*'Festival Rose'.* This hot pink-colored poinsettia features large, long-lasting bracts.

*'Red Angel'.* A compact to medium height poinsettia with very dark green leaves that set off the intense red bracts.

**Oglevee Ltd.**, 152 Oglevee Lane, Connellsville, PA 15425-3888. (800) 437-4733. [www.oglevee.com](http://www.oglevee.com).



## 'Sonora Marble' and 'Carousel'

*'Sonora Marble'.* With beautifully shaped, hollylike bracts highlighted by creamy pink and white marbling, this poinsettia fits in well with contemporary interior designs.

*'Carousel'.* Curled and ruffled red outer bracts contrast with the smoother inner bracts held close to the center, giving the appearance of a carousel in motion.

**Fischer USA**, 2995 Wilderness Place, Suite 102, Boulder, CO 80301.  
(303) 415-1466. [www.fischerusa.com](http://www.fischerusa.com).



# Book Reviews

## Passionate Gardening: Good Advice for Challenging Climates.

Lauren Springer and Rob Proctor. Fulcrum Publishing, Golden, Colorado, 2000. 336 pages. 9<sup>3</sup>/<sub>4</sub>" x 9<sup>3</sup>/<sub>4</sub>". Publisher's price, hardcover: \$34.95.

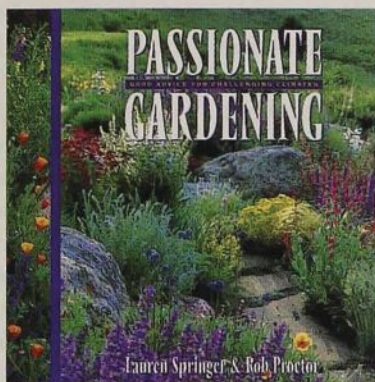
SOME PEOPLE garden involuntarily. Beyond breathing, eating, and sleeping, their lives depend on turning the soil and coaxing seeds to sprout, on finding the perfect plants for difficult places. Lauren Springer and Rob Proctor are such gardeners, and their latest team effort, *Passionate Gardening*, is a compilation of essays that individually inform,

inspire, and entertain, and together blend and contrast two very different gardening styles. Both voice strong feelings and use words the same way they cultivate plants, with skill and pleasure. Springer praises clay soil as having a "cold but careful heart," and Proctor scorns "hybrid rose ghettos" as requiring "more chemicals than a heavy metal rock tour." A Springer motto, "There is no such thing as a bad plant, just bad planting," should hang above every potting bench.

*Passionate Gardening* is arranged into sections from the obvious: "Design and Inspiration" and "Through the Seasons" to the eclectic: "Common Ground," "Challenges," and "Perspectives." In theory, you can let the book fall open and read a single essay, but the style, the ideas, and the illustrations are so engaging you'll have perused a dozen essays before you remember you really should be out weeding. Can you help but love a gardening book that begins with "The Killing Fields"—an ode to all the failures that finally yield success?

Nearly half the book eases and propels

us through the seasons. Spring unfolds as the time of extremes, high and lows both in temperature and temperament. We can share the frustration of too much to do to enjoy the effort, and too much satisfaction gained to ever consider stopping, a perverse Zen experience that will resonate with other passionate gardeners. Springer offers suggestions on excep-



tional varieties of irises, lilacs, crabapples, and penstemons, while Proctor contemplates the virtues of good timing, and cautions against abusing the shrubbery. "If nature had intended her junipers to look like poodles," he writes, "she'd have given them a different kind of bark."

The summer essays feature planting for hummingbirds and night fragrance, and insights about the twin concerns of every western gardener: water and sun. You'll have to read the book yourself to find out what summer gardening has to do with Picasso and the Queen of England's legs.

Fall's essays are ripe with bulb planting, leaves turning, and Proctor's "Winding Down." He describes autumn as a "horticulturally sober" time when a gardener gains the perspective to recognize and correct any misplaced ideas born of spring's frenzy that got out of hand in the heat of summer. To celebrate winter, they give us good excuses to retreat from the labors of the garden, to read, and to explore catalogs that will guarantee aching muscles come the thaw.

Proctor and Springer are living proof that the spirit driving the wheelbarrow makes a garden far more than the sum of its plants. Hundreds of plants are noted, some in detail, others with enough context to help sort out their potential in gardens well outside Col-

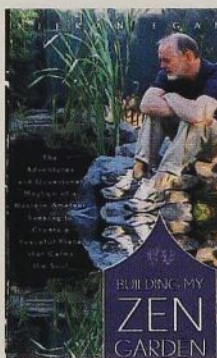
orado. The subtitle "Good Advice for Challenging Climates" is as much about attitude as it is about altitude. Whether or not their favorites will grow in your garden, Springer and Proctor's love of plants and the enticing images of their gardens make *Passionate Gardening* an innocent pleasure to peruse.

*Judith Phillips is a writer, xeric plant grower, and garden designer with a passion for the high desert of New Mexico.*

## Building My Zen Garden.

Kieran Egan. Houghton Mifflin, Boston, Massachusetts, 2000. 256 pages. 5<sup>1</sup>/<sub>2</sub>" x 9". Publisher's price, softcover: \$24.

SOME OF OUR best garden writing comes from those who are academically trained in other fields but who are enthusiastically self taught in horticulture. Two shining examples are Allen Lacy and Roger Swain. Kieran Egan also fits this mold. He has doctorates in education from Cornell and Stanford and has published 16 academic books.



*Building My Zen Garden* is about Egan's experiences building a Zen-style garden in his western Canada neighborhood. Early on the author

protests that while he grows a few vegetables, his wife is the real gardener in the family. There are hints throughout the book, however, that gardening has captured another academic victim. Once the pond, waterfalls, and bog have been completed and friends suggest he "must enjoy sitting here watching the goldfish among the floating plants, with the sound of the water running among the stones of the stream," Egan responds that "the pleasure mainly



comes through others' pleasure. To have made something that seems to delight friends and relations is a delight. But when I sit here by myself, I see mainly what needs to be done, or what needs correcting." How like an experienced gardener!

Egan also states that the Zen "thing" did not quite cut through his Irishness and personal assimilation into western culture. However, he writes, "what does give unalloyed pleasure is to see insects and birds, and the fish, taking this construction as part of the natural world. I get much pleasure, even joy, from the squirrel that runs along the roof of the fence, the dragonfly resting on a water lily leaf, or birds having an energetic bath in a shallow pool they have found or made in the bog." Zen or not, something got to him, and I am glad he has chosen to share it.

Perhaps what is most appealing is Egan's self-effacing humor and honesty when sharing the trials of an untrained builder, including the strains, sprains, blood, and bruises. He is such a totally likeable author and writes so well that even though I have no desire to build a Zen-style garden, I was immediately drawn into his world through to the end of the book.

As with other project books, the author must ask at the end whether it was worth it. Egan's honest answer is "maybe." In the last chapter he writes, "I was going to say that I would finish and then there would be just routine pottering, that there comes an indefinite and indistinct time when one moves from making to maintaining. But there is no finishing point because there is always something to add or change to take the garden closer to the foolish heart's desire. It is only our stories that have beginnings and endings. Nature doesn't recognize our starts and finishes."

Gardening and some Zen philosophy have captured him. Readers are better off because Egan has chosen to share his experience and provide us with knowledge, wisdom, and some vicarious pleasure. My copy of his book is now on loan to another gardener.

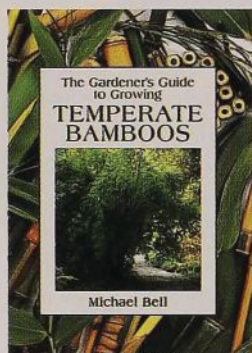
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*A horticultural extension specialist at North Carolina State University, Richard E. Bir is the author of Growing and Propagating Showy Native Woody Plants.*

## The Gardener's Guide To Temperate Bamboos.

Michael Bell. Timber Press, Portland, Oregon, 2000. 160 pages. 7 1/2" x 9 3/4". Publisher's price, hardcover: \$29.95.

IT IS IMPOSSIBLE to think of China, Japan, and most of the rest of Asia without bamboo—it is an integral part of life there. Bamboo is used in all manner of building, from construction of a house to furnishing its interior with mats, baskets, walls, and furniture. The foliage is used as forage and the shoots are included in almost all Asian cuisines. With this high profile interest in Asia, it is really rather shocking that bamboos are not only held in relatively low esteem in the rest of the world, but that as ornamental plants they



have been the subject of bad press and determined hostility.

Now we have a modest book for the home gardener with a positive attitude and a wealth of facts.

*Temperate Bamboos* by Michael Bell, the latest volume of the Gardener's Guide series published by Timber Press, fills many gaps in general bamboo perception and specific information about these varied plants.

Bell's budding interest in bamboos was strongly influenced by A.H. Lawson's *Bamboos: A Gardener's Guide to their Cultivation in Temperate Climates*, published in 1968. Noting that Lawson's book "is sadly out of print, very difficult to obtain, and, naturally, in great need of revision," Bell says his goal was to emulate Lawson's emphasis on practical experience and advice for growing bamboos, while at the same time updating the nomenclature and research on the subject.

This is actually two books in one: The first half is an excellent introduction to the scientific and horticultural nature of bamboos, while the second half is an alphabetica guide to genera, species, and cultivars suited to the garden.

Bamboo botany is clearly presented and easy to understand, thanks to excellent line drawings. Excellent photographs,

mostly by Marie O'Hara and Karl Adamson, are not only beautiful, they often show key characters of anatomy and structure. After all, it is important for bamboo growers to know the how and why of clumping versus running species and the peculiar natures of these giant grasses in order to grow them properly.

Inevitably Bell addresses the subject of how to prevent or control the spread of overly rambunctious "running" bamboos—those that colonize rapidly with the aid of underground rhizomes. Some running bamboos can be invasive—although many problem plantings can be attributed to inattentiveness on the gardener's part—and knowing the potential difficulties prior to planting is the best way to avoid such unfortunate results.

The alphabetic guide covers almost all the readily available bamboos, as well as a few rare and desirable selections. For each a description, history, and suggested uses are provided, as well as hints to aid identification. Bamboos are difficult to identify and their taxonomy is very confused. Gardeners will find old friends like yellow-groove bamboo (*Phyllostachys aureosulcata*) and the dwarf *Sasa* and *Pleioblastus* ground covers, as well as new beauties such as *Chimonobambusa tumidissinoda* and a variety of South American *Chusquea* species.

Some reservations must be noted: This book is British, not just in spelling, but in its lack of any real discussion of hardiness, cold tolerance, or winter care. Many of the bamboos included here will thrive in the mild climate of southern England, but face a harsher reality in the continental United States. A few species are essentially tropical and a number require USDA Zones 9 and warmer or the cool maritime climate of our northwestern states.

Despite this gap in hardiness information, the basic and substantial coverage of these intriguing woody grasses makes this volume the best modern introduction to the subject now available. One can only hope that its positive approach will assist gardeners in making practical decisions as they venture into the fascinating world of bamboos. 🌱

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*James Waddick, past editor of "Anything But Green," a newsletter on variegated plants, has grown nearly 200 hardy bamboos in his Kansas City, Missouri garden.*

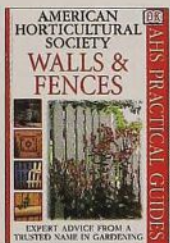


## Gardeners' Gift Books

You are sure to find some thoughtful gifts for gardeners among the following titles. Through a special arrangement with Amazon.com, you can order these books and the ones in the preceding review pages at a discount off the publisher's price by clicking on the Bookstore section of the AHS Web site ([www.ahs.org](http://www.ahs.org)). From there, click on Book Recommendations, and then on the icon for the November/December 2000 issue of *The American Gardener*.

### AHS Practical Guides: Walls & Fences.

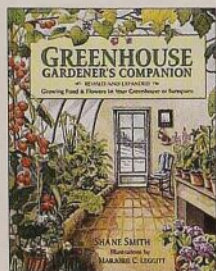
Linda Hawthorne. DK Publishing, Inc., New York, New York, 2000. 72 pages. Publisher's price, softcover: \$8.95.



WALLS AND fences can be both practical and decorative as this concise, well-illustrated volume from the AHS Practical Guide series demonstrates. Styles, materials, and construction are discussed, as are planting schemes for the areas near walls and fences. Whether you are interested in designing a rustic picket fence or building a drystone wall, this book will provide both instruction and inspiration.

### Greenhouse Gardener's Companion: Growing Food & Flowers in Your Greenhouse or Sunspace.

Shane Smith. Fulcrum Publishing, Golden, Colorado, 2000. 497 pages. Publisher's price, softcover: \$21.95.

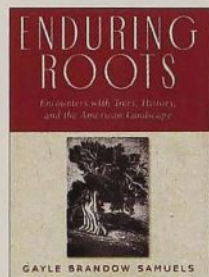


THIS revised and expanded edition of a book originally published in 1992 covers greenhouse gardening from the design and construction of the facility and managing its climate to selecting, propa-

gating, scheduling, and growing the plants. Extensive coverage is given to management of pests and diseases. Practical appendices such as Helpful Associations and Organizations, Mail Order Supplies, and Record Keeping are included. More than 250 black and white drawings, photographs, and charts help illustrate the text.

### Enduring Roots: Encounters with Trees, History, and the American Landscape.

Gayle Brandow Samuels. Rutgers University Press, New Brunswick, New Jersey, 1999. 193 pages. Publisher's price, hardcover: \$25.



THIS book is a compilation of stories of many historic American trees, with each chapter focusing on a particular tree or group of trees, including the "wild apples" celebrated by Henry David Thoreau, the Charter Oak of Connecticut—which played a role in the American Revolution, and the Japanese cherries that have become the official tree of our nation's capital. Each story represents part of our national and natural history, and will add to the reader's appreciation of both.

### Creating a Cottage Garden in North America.

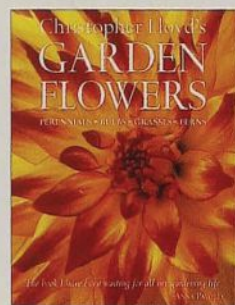
Stephen Westcott-Gratton. Photographs by Paddy Wales. Fulcrum Publishing, Golden, Colorado, 2000. 160 pages. Publisher's price, hardcover: \$29.95.

WRITTEN IN a lively, informative style, this book is punctuated with humor and history. Beginning with an explanation about what makes a cottage garden and how the style evolved, the author addresses different climatic regions, soils,

and plant types including annual, biennial, and perennial flowers; bulbs; herbs and vegetables. Descriptions, colorful photos, growing tips, and names of recommended varieties accompany each plant listing.

### Christopher Lloyd's Garden Flowers: Perennials, Bulbs, Grasses, Ferns.

Christopher Lloyd. Timber Press, Portland, Oregon, 2000. 448 pages. Publisher's price, hardcover: \$54.95.



THESE plants, both common and obscure, are among those that the author has grown over the years. Lively and opinionated as ever, Lloyd discusses the

habit of each plant and, from personal experience, garden situations in which they thrive. He also addresses their shortcomings and their susceptibility to pests and disease. Color photographs provide ideas for combining different plants in a garden for spectacular effect.

### The Kids Can Press Jumbo Book of Gardening.

Karyn Morris. Kids Can Press, Niagara Falls, New York, 2000. 239 pages. Publisher's price, softcover: \$14.95.

BEGINNING WITH the basics of how plants grow, Morris moves right into topics such as starting plants from seed, weeding, watering, and composting. Lots of illustrations make explanations easy for children to follow. Clever, engaging projects such as "planting" a scarecrow, building a bean teepee, and planting an old pair of shoes with flowers will have kids reaping the rewards of their efforts as they learn the fundamentals—and the fun—of gardening.



# Regional Happenings

## NORTHEAST

THROUGH NOV. 19. **Japanese Autumn Garden: Momijigari.** New York Botanical Garden, Bronx, New York. (718) 817-8700.

NOV. 4-19. **Chrysanthemum Show.** The Botanic Garden of Smith College, Northampton, Massachusetts. (413) 585-2740.

NOV. 4-19. **Chrysanthemum Show.** Buffalo & Erie County Botanical Garden, Buffalo, New York. (716) 696-3555.

NOV. 9. **Demystifying Bamboo in the Urban Garden.** Lecture by Michael Alfano. Horticultural Society of New York, New York. (212) 757-0915.

NOV. 23-JAN. 1. **Christmas at the Newport Mansions.** Sponsored by the Preservation Society of Newport County. Newport, Rhode Island. (401) 847-1000.

NOV. 24-JAN. 7. **Holiday Garden and Train Show.** New York Botanical Garden, New York, New York. (718) 817-8700.

## MID-ATLANTIC

THROUGH NOV. 19. **Chrysanthemum Festival.** Longwood Gardens, Kennett Square, Pennsylvania. (610) 388-1000.

THROUGH FEB. 25. **Garden Railroad.** Phipps Conservatory and Botanical Gardens, Pittsburgh, Pennsylvania. (412) 622-6914.

NOV. 6 & 7. **Wildlife Habitat Council's 12th Annual Symposium.** Renaissance Harborplace Hotel, Baltimore, Maryland. (301) 588-8994.

NOV. 11. **The Delight of Bulbs as Companion Plants.** Lecture by Brent Heath. Brookside Gardens, Wheaton, Maryland. (301) 962-1451.

NOV. 11. **Tea & Violets at Washington's National Cathedral.** Hosted by the American Violet Society. Washington, D.C. (703) 707-0049.

NOV. 23-JAN. 1. **Christmas at Longwood.** Longwood Gardens, Kennett Square, Pennsylvania. (610) 388-1000.

NOV. 24-JAN. 7. **Gifts Under Glass.** Flower

## AHS Events

Events sponsored or co-sponsored by AHS are indicated by an **AHS** symbol. Expanded and updated Regional Happenings listings can be viewed on the Society's Web site at [www.ahs.org](http://www.ahs.org).

show. Phipps Conservatory and Botanical Gardens, Pittsburgh, Pennsylvania. (412) 622-6914.

DEC. 1, 2, & 4. **Wreath Workshops.** Monticello, Charlottesville, Virginia. (804) 984-9822.

DEC. 2. **Holiday Greens Sale & Open House.** Historic Bartram's Garden, Philadelphia, Pennsylvania. (215) 729-5281.

DEC. 2. **Wreath Workshop.** U.S. National Arboretum, Washington, D.C. (202) 245-4523.

DEC. 8-10. **Christmas at an English Country House.** Ladew Topiary Gardens, Monkton, Maryland. (410) 557-9466.

DEC. 11. **Arboretum By Moonlight.** Guided hike. U.S. National Arboretum, Washington, D.C. (202) 245-4523.

## SOUTHEAST

NOV. 4 & 5. **Amazing Mums.** The 49th Annual Chrysanthemum Show of the Georgia Chrysanthemum Society. Atlanta Botanical Garden, Atlanta, Georgia. (404) 876-5859.

NOV. 4 & 5. **Mount Dora Plant & Garden Fair.** Gilbert Park, Mount Dora, Florida. (352) 357-4116.

NOV. 10-12. **Orchidfest.** Atlanta Botanical Garden, Atlanta, Georgia. (404) 876-5859.

NOV. 11 & 12. **Ramble: A Garden Festival.** Fairchild Tropical Garden, Coral Gables, Florida. (305) 667-1651.

NOV. 14. **Mosses In Your Garden.** Lecture by Hal Massey. Hosted by the Georgia Native Plant Society. Atlanta Botanical Garden, Atlanta, Georgia. (770) 343-6000.

NOV. 16. **On The Trail for Plants and Inspiration.** Lecture by Elizabeth Dean. Hosted by

the Georgia Perennial Plant Association. Atlanta History Center, Atlanta, Georgia. (404) 237-8071.

NOV. 17-DEC. 31. **Garden of Lights.** Norfolk Botanical Garden, Norfolk, Virginia. (757) 441-5830.

NOV. 18 & 19. **Garden Festival.** Heathcote Botanical Garden, Fort Pierce, Florida. (561) 464-4672.

NOV. 22-JAN. 7. **Garden of Lights.** Cypress Gardens, Cypress Gardens, Florida. (800) 282-2123.

NOV. 26-DEC. 31. **Magic Christmas in Lights.** Bellingrath Gardens and Home, Theodore, Alabama. (334) 973-2217.

DEC. 2. **Holiday Home & Garden Tour.** Sponsored by the Gibbes Museum of Art. Charleston, South Carolina. (843) 722-2706.

DEC. 8-10. **Winter Holidays.** Harry P. Leu Gardens, Orlando, Florida. (407) 246-2620.

DEC. THROUGH MID-JAN. **Country Christmas.** Atlanta Botanical Garden, Atlanta, Georgia. (404) 876-5859.

## NORTH CENTRAL

NOV. 4. **Gardening From the Catalog: The World at Your Fingertips.** Symposium. Olbrich Botanical Gardens, Madison, Wisconsin. (608) 246-4550.

NOV. 14. **Fruits in the Culinary Landscape.** Lecture by Martha Davis. Morton Arboretum, Lisle, Illinois. (630) 719-2468.

NOV. 24-DEC. 31. **Celebrations Holiday Festival.** Chicago Botanic Garden, Glencoe, Illinois. (847) 835-5440.

WEEKENDS, NOV. 24-DEC. 23. **Garden of Lights.** Green Bay Botanical Garden, Green Bay, Wisconsin. (920) 490-9457.

DEC. 2 & 3. **Festival of Light.** Botanica: The Wichita Gardens, Wichita, Kansas. (316) 264-0448.

DEC. 2-JAN. 7. **Annual Christmas Poinsettia Display.** Anna Scripps Whitcomb Conservatory, Belle Isle, Detroit, Michigan. (313) 852-4064.



DEC. 7-9. **Holiday Plant Sale.** Chicago Botanic Garden, Glencoe, Illinois. (847) 835-5440.

DEC. 9-31. **Olbrich's Holiday & Train Show.** Olbrich Botanical Gardens, Madison, Wisconsin. (608) 246-4550.

#### SOUTH CENTRAL

NOV. 4. **Fall Family Garden Fair.** San Antonio Botanical Gardens, San Antonio, Texas. (210) 207-3250.

DEC. 2. **Carols & Crumpets Herb Festival.** Tulsa Garden Center, Tulsa, Oklahoma. (918) 836-5307.

DEC. 2. **Holiday Herbs.** Herbs and decorations for sale. McAshan Herb Gardens at Festival Hill, Round Top, Texas. (979) 249-5283.

#### NORTHWEST

NOV. 26-DEC. 31. **Garden D'Lights.** Bellevue Botanical Garden, Bellevue, Washington. (425) 452-2750.

DEC. 2-10. **Holidays at Hoyt.** Wreath workshops, gifts, and plants. Hoyt Arboretum, Portland, Oregon. (503) 228-8733.

#### SOUTHWEST

DEC. 1 & 2. **Holiday Fair.** Albuquerque Garden Center, Albuquerque, New Mexico. (505) 296-6020.

DEC. 1-3. **Noches des las Luminarias.** Desert Botanical Garden, Phoenix, Arizona. (480) 941-1225.

DEC. 1-3. **Luminaria Nights.** Tucson Botanical Gardens, Tucson, Arizona. (520) 326-9686.

DEC. 1-30. **River of Lights.** Rio Grande Botanic Garden, Albuquerque, New Mexico. (505) 764-6200.

#### WEST

NOV. 4 & 5. **Japanese Garden Festival.** Descanso Gardens, La Canada, California. (818) 952-4401.

DEC. 27-31. **Suiseki Show.** Huntington Botanical Gardens, San Marino, California. (626) 405-2141.

#### CANADA

NOV. 2-12. **The Winter Garden Show at the Royal.** The Coliseum at the National Trade Centre, Exhibition Place, Toronto, Ontario. (416) 263-3400.

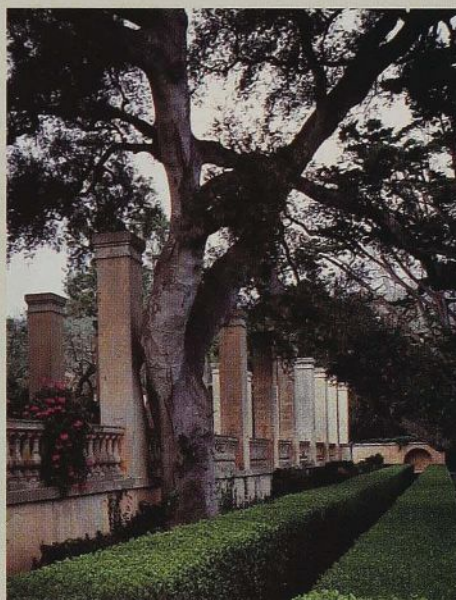
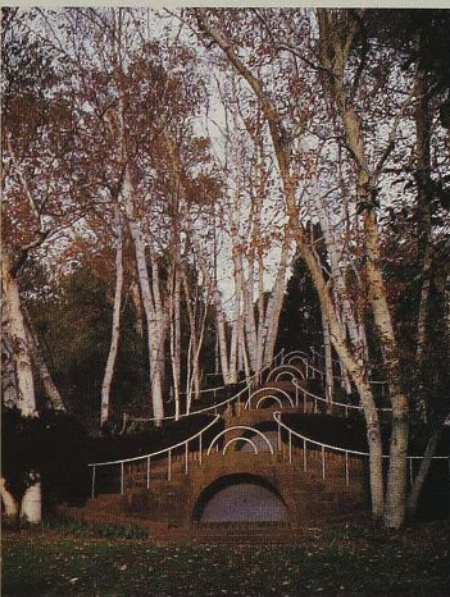
DEC. 8-31. **Festival of Lights.** VanDusen Botanical Garden, Vancouver, British Columbia. (604) 878-9274.

## Snapshots of the Country Place Era

UNITING the common threads in the landscapes of seven historic estates, a new exhibition at the PaineWebber Art Gallery in New York, New York, celebrates a previously unexamined period of American landscape architecture through a collection of contemporary photographs. "A Genius for Place: American Landscapes of the Country Place Era" features 70 black-and-white photographs and seven color images by award-winning landscape photographer Carol Betsch.

Built between 1900 and 1940—a period when American rail and road systems were rapidly expanding—these lavish "country places" were commissioned by wealthy American industrialists as pastoral escapes from their workaday urban worlds. The rare landscapes included in the exhibition span the United States from coast to coast, ranging from eastern masterpieces such as Naumkeag, the estate of Mabel Choate in Stockbridge, Massachusetts, to Val Verde in Santa Barbara, California, built by Wright S. Ludington. "I felt these seven estates were the most representative examples of the period, reflecting a chronology of the integration of naturalistic and formal design elements," says Robin Karson, the exhibit's curator and director of the Library of American Landscape History in Amherst, Massachusetts. "Their great cohesiveness, spatially and architecturally, make these landscapes great works of art." All of the historic estates featured in the exhibition retain significant portions of their original designs and are accessible to the public.

The PaineWebber Art Gallery is located in PaineWebber's corporate headquarters at 1285 Avenue of the Americas in New York City. The exhibition is open weekdays from 8 a.m. to 6 p.m. through December 1; admission is free. For more information, call (212) 713-2885. "A Genius for Place" will open in Washington, D.C., in the fall of 2001, then tour the United States over the following two years. A corresponding book by Karson will also be published at the end of 2001.



Naumkeag, top, and Val Verde, above, are depicted in two of the color photographs by Carol Betsch now on display at the PaineWebber Art Gallery in New York City.

—Margaret T. Baird, Communications Assistant



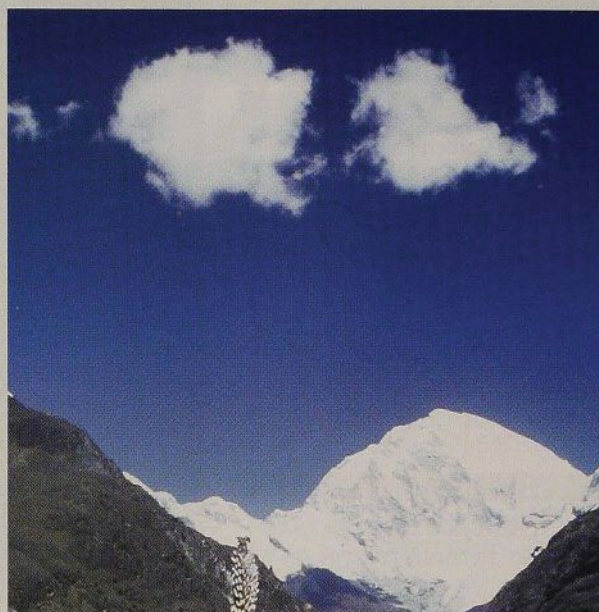
# Global Warming and the Greenhouse Effect

The earth's atmosphere has been compared with a giant greenhouse because of the presence of certain gases in the atmosphere that trap heat in much the same way the walls and roof of a greenhouse do. These gases allow light to reach the earth but trap infrared radiation, causing the atmosphere to be warmer than it would be otherwise. Water vapor accounts for over 95 percent of greenhouse gases, while carbon dioxide (CO<sub>2</sub>), methane, and trace gases comprise the remainder. Without the greenhouse effect the atmosphere would be about 60 degrees colder than it is now and life as we know it would not exist. Accounts of global warming are based on the theory that if the level of greenhouse gases in the atmosphere increases, the earth's temperature will rise.

The amount of CO<sub>2</sub> in the atmosphere has been rising since the beginning of the Industrial Revolution in the late 18th century because CO<sub>2</sub> is a byproduct of combustion. CO<sub>2</sub> levels now stand at about 375 parts per million (ppm), or .0375 percent of the gases in the atmosphere; pre-industrial levels were about 265 ppm. In contrast, water vapor molecules are about 100 times as numerous as CO<sub>2</sub>, which is why most of the greenhouse effect is caused by water. But it stands to reason that an increase in CO<sub>2</sub> will cause temperatures to increase.

How much temperatures will rise and whether natural variations in climate will amplify or negate the increase are questions that continue to be studied and debated without clearly consistent agreement among researchers. There is some consensus, however, on when and where the temperature increases will most likely occur.

Because an arid atmosphere contains less water vapor than a humid atmosphere, changes in the level of CO<sub>2</sub> are more sig-



nificant in areas of low humidity. On Earth, the driest air occurs in winter over land masses such as Siberia, central Canada, and the north central United States. Everywhere else there is adequate water vapor to account for most of the greenhouse effect, minimizing the effect of the increase in CO<sub>2</sub>.

Since CO<sub>2</sub> has increased by nearly 50 percent since the Industrial Revolution—and since most future climate projections assume that it will increase by another 50 percent in the next century—we should be able to use temperature trends over the last 100 years to help us predict what will happen in the next century.

—GEORGE TAYLOR

*continued from page 23*

have been using crop rotations to manage your farm or garden, it paid off."

At River Farm, the American Horticultural Society headquarters in Alexandria, Virginia, director of horticulture Janet Walker also observed a marked increase in the incidence of disease. Additionally, lawn areas required more mowing than usual because the turf grass never went dormant.

## Southeast

But further south, drought conditions prevailed. Raymond Zerba, agricultural extension agent in Clay County, Florida, explains that northeast Florida has experienced three consecutive years of unseasonable droughts that start after spring

green-up in April or May and persist into September. Though many gardeners provide supplemental water to their gardens, Zerba observes that this is often insufficient. The stress that results, especially with trees, makes them more susceptible to damage from insects and disease. "As a result, we see them just suddenly up and die. That's been happening a lot this year among some of our large shade trees," Zerba says. "This extended drought seems now to be taking a toll."

## North Central

Sandy Mason, horticultural extension educator in Champaign, Illinois, explains that this year has been either wet or dry, depending on where in Illinois you are standing. "Just north of us they are much drier," she says, "and to the

south they are practically swimming." While last August was cooler than usual, recent winters have been warmer. This is likely the reason for this season's high numbers of certain insect pests such as Japanese beetles.

Milder winters have also meant certain marginally hardy plants have survived. But Mason notes that in general, "plants that were well sited and selected are doing fine to great; those on the edge where we have made poor choices or conducted poor management practices are suffering." She observes that this reinforces the importance of good basic plant care, and that "in this ball game, Mother Nature bats last."

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



# Classifieds

**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. Send orders to: AHS Advertising Office, 1775 Jamieson Street, Suite 210, Alexandria, VA 22314-5715. Phone (703) 518-4700; fax (703) 518-8495.

## BOOKS

**Hortica: Color Cyclopedic of Garden Flora** with Hardiness Zones and Indoor Plants, 8,100 color photos by Dr. A. B. Graf, \$195.

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Shipping additional. Circulars gladly sent.

**ROEHRS Co.,** Box 125, East Rutherford, NJ 07073. (201) 939-0090. FAX (201) 939-0091.

## GREENHOUSE PLASTICS

**BOB'S SUPER-STRONG GREENHOUSE PLASTIC**—Pond Liners. Resists hailstones, yellowing, leafburning. Samples: 2 stamps appreciated. Box 42AG, Neche, ND 58265; (204) 327-5540 daily.

## PEONIES

**BEAUTIFUL JAPANESE/CHINESE TREE PEONIES.** Wide variety of exotic, INEXPENSIVE peonies available. Catalog \$3. All plants 3 years old and older. SMIRNOW'S SON'S PEONIES, Dept. AG, 168 Maple Hill Road, Huntington, NY 11743. Phone: (631) 421-0836.

## ROSES

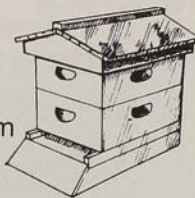
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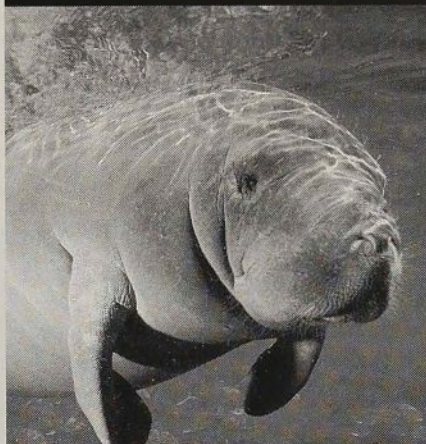
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I certify that all information furnished above is true and complete.  
—David J. Ellis, Editor

## MATCH POINT

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# Pronunciations and Planting Zones

Most of the cultivated plants in this issue are listed here with their pronunciations and USDA Plant Hardiness and AHS Plant Heat Zones. If 0 is listed in place of USDA hardiness zones, it means that plant is a true annual—it completes its life cycle and dies in a year or less. Tropical plants that are hardy only in USDA Zone 11 are listed by minimum average temperature. To purchase an AHS Plant Heat Zone Map, call (800) 777-7931 ext. 0.

## A-H

**Abies concolor** AY-beez KON-kuh-ler (3-7, 7-1)  
**Amelanchier alnifolia** am-eh-LANG-kee-ur al-nih-FO-lee-uh (4-9, 8-3)  
**Aronia arbutifolia 'Brilliantissima'** uh-RO-nee-uh ar-byew-tih-FO-lee-uh (4-9, 9-4)  
**A. melanocarpa** A. mel-an-o-KAR-puh (3-8, 8-1)  
**Asclepias incarnata** as-KLEE-pee-us in-kar-NAY-tuh (3-8, 8-1)  
**A. tuberosa** A. too-bur-O-suh (3-9, 9-2)  
**Buxus sempervirens 'Suffruticosa'** BUCKS-us sem-pur-VY-renz (6-8, 9-6)  
**Calamagrostis x acutiflora 'Karl Foerster'** kah-luh-mah-GROS-tiss ak-yew-tih-FLOR-uh (4-9, 9-5)  
**Callicarpa americana** kal-lih-KAR-puh uh-mair-ih-KAN-uh (7-10, 9-6)  
**C. bodinieri var. giraldii 'Profusion'** C. boh-dih-NYE-air-eye var. jir-ALL-dee-eye (5-8, 8-3)  
**C. dichotoma** C. dy-KOT-o-muh (5-8, 8-7)  
**C. japonica** C. jah-PON-ih-kuh (5-8, 12-3)  
**Calocedrus decurrens** kah-lo-SEED-rus deh-KUR-renz (6-10, 8-4)  
**Camassia quamash** kuh-MASS-ee-uh KWAH-mash (4-10, 12-1)  
**Chamaecyparis lawsoniana** kam-ee-SIP-uh-riss law-son-ee-AN-uh (5-9, 9-5)  
**C. nootkatensis** C. newt-kuh-TEN-sis (4-7, 7-1)  
**Chionanthus pygmaeus** ky-o-NAN-thus pig-MAY-us (6-8, 8-6)  
**Clarkia pulchella** KLARK-ee-uh pul-KEL-uh (0, 6-1)  
**Claytonia lanceolata** clay-TOH-nee-uh lan-see-o-LAY-tuh (4-8, 8-3)  
**Cleome serrulata** klee-O-mee sur-yew-LAY-tuh (0, 12-1)

**Heteromeles arbutifolia** het-ur-o-ME-leez ar-byew-tih-FO-lee-uh (8-10, 12-8)  
**Hibiscus syriacus** high-BISS-kus sih-ree-AH-kus (5-9, 10-3)

## I-P

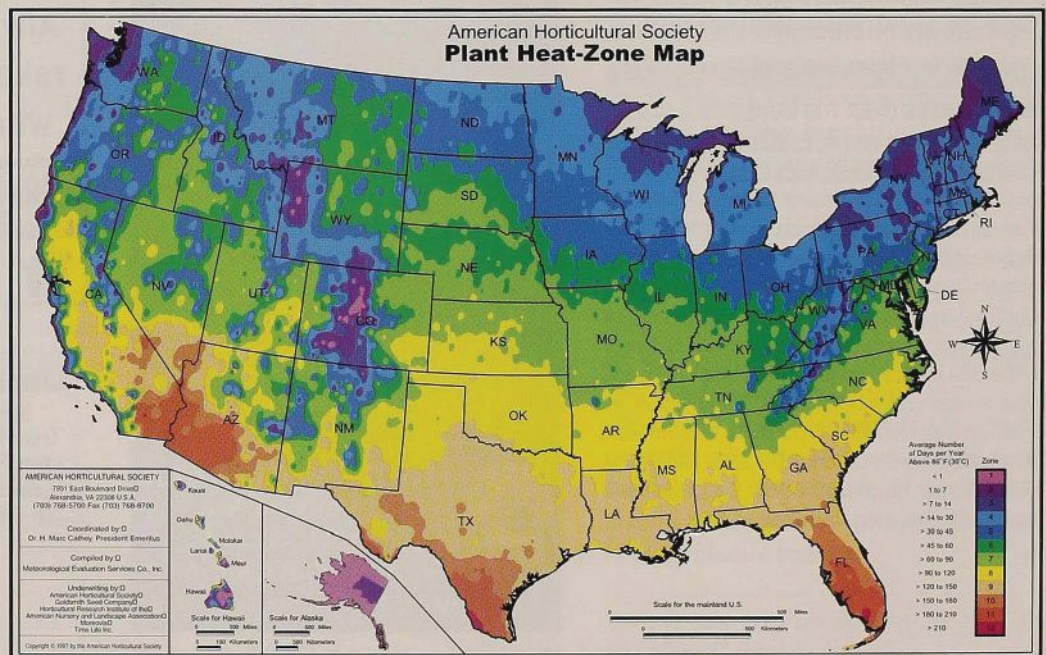
**Ilex decidua 'Warren's Red'** EYE-leks deh-SID-yew-uh (5-9, 9-5)  
**I. serrata** I. sair-RAY-tuh (5-8, 8-5)  
**I. verticillata** I. vur-tih-sih-LAY-tuh (4-8, 8-5)  
**Juniperus scopulorum** joo-NIP-er-iss skop-yew-LOR-um (3-7, 7-1)  
**J. virginiana** J. vir-jin-ee-AN-uh (3-9, 9-1)  
**Lewisia rediviva** loo-ISS-ee-uh reh-dih-VY-vuh (4-7, 8-3)  
**Lindera benzoin** lin-DAIR-uh BEN-zo-in (4-9, 8-1)  
**Linum lewisii** LIE-num pur-EN-ee (7-9, 9-7)  
**Lycium carolinianum** lie-SEE-um keh-ro-lin-ee-AN-num (5-9, 9-5)  
**Maclura pomifera** muh-KLUR-uh pom-IF-ur-uh (5-9, 9-4)  
**Mahonia aquifolium** mah-HO-nee-uh ah-kwi-FO-lee-um (5-9, 9-3)  
**M. bealei** M. BEEL-ee-eye (6-8, 8-3)  
**M. nervosa** M. ner-VO-suh (5-7, 7-4)  
**Malus sargentii** MAL-us sar-JEN-tee-eye (4-8, 8-1)  
**Myrica cerifera** my-RIH-kuh seh-RIF-er-uh (7-10, 10-5)

**M. pensylvanica** M. pen-sil-VAN-ih-kuh (3-7, 7-1)  
**Nelumbo lutea** neh-LUM-bo LEW-tee-uh (4-11, 12-3)  
**Oemleria cerasiformis** ohm-LAIR-ee-uh seh-ras-sih-FOR-miss (5-9, 9-6)  
**Oenothera caespitosa** ee-no-THEE-ruh sez-pih-TOH-suh (4-8, 8-1)  
**Picea pungens** PIE-see-uh PUN-jenz (3-8, 8-1)  
**Pinus palustris** PIE-nus pah-LUS-triss (8-11, 12-8)  
**P. strobus** P. STRO-bus (4-9, 9-1)  
**P. strobus 'Torulosa'** P. STRO-bus (3-9, 9-1)  
**Plectranthus australis** plek-TRAN-thus aw-STRAY-liss (11, 12-1)  
**Prunus serrulata** PROO-nus sair-yew-LAY-tuh (5-8, 8-6)  
**P. yedoensis** P. yed-o-EN-siss (6-8, 8-6)  
**Pyracantha coccinea** pie-ruh-KAN-thuh kok-SIN-ee-uh (6-9, 9-3)

## Q-Z

**Quercus virginiana** KWER-kus vir-jin-ee-AN-uh (8-11, 12-8)  
**Rhus aromatica** RUS ah-ro-MAT-ih-kuh (4-9, 9-4)  
**R. glabra** R. GLAB-ruh (3-9, 9-3)  
**R. typhina** R. tie-FEE-nuh (4-8, 8-1)  
**Sabal minor** SAY-bul MY-nor (11, 12-10)  
**Sambucus caerulea** sam-BOO-kus see-ROO-lee-uh (5-8, 8-4)

**S. canadensis** S. kan-uh-DEN-siss (4-9, 9-3)  
**Serenia repens** sair-eh-NO-uh REP-enz (9-11, 12-9)  
**Shepherdia argentea** shep-HURD-ee-uh ar-JEN-tee-uh (3-7, 7-1)  
**S. canadensis** S. kan-uh-DEN-siss (2-6, 6-1)  
**Spartina bakeri** spar-TY-nuh BAY-ker-eye (4-7, 7-1)  
**Symphoricarpos albus** sim-fo-rih-KAR-poz AL-bus (3-7, 7-1)  
**S. orbiculatus** S. or-bik-yew-LAY-tus (2-7, 7-1)  
**Symplocos paniculata** sim-PLO-kus pan-ik-yew-LAY-tuh (4-8, 8-4)  
**Syringa vulgaris** sih-REENG-guh vul-GAIR-iss (3-8, 8-3)  
**Tanacetum niveum** tan-uh-SEE-tum nih-VEE-um (5-9, 9-1)  
**Thuja occidentalis** THEW-yuh ahk-sih-den-TAL-iss (2-7, 7-1)  
**Tsuga canadensis** SOO-gah kan-uh-DEN-siss (4-8, 8-1)  
**Viburnum dilatatum** vy-BUR-num dih-luh-TAY-tum (5-8, 8-5)  
**Viburnum lantana** V. lan-TAN-uh (4-7, 7-1)  
**Viburnum nudum 'Winterthur'** V. NEW-dum (5-9, 9-5)  
**Viburnum trilobum** V. try-LO-bum (2-7, 7-1)  
**Zamia pumila** ZAY-mee-uh PYEW-mil-uh (11, 12-10)  
**Zinnia grandiflora** ZIN-ee-uh gran-dih-FLOR-uh (4-10, 10-1)







# Notes from River Farm

## What Goes Around

by Janet Walker

**W**E'RE IN THE PROCESS of developing a new Visitor Center in one of the buildings at River Farm, and we'll be designing and installing a new garden around it in the weeks to come. Since this will be our year-round welcome mat, and its scale is intimate, we're naturally thinking in terms of small evergreens as a foundation for the landscape.

For inspiration there is no finer example in the world of the variety and potential of small conifers than the Gotelli Collection of Dwarf and Slow-Growing Conifers at the U.S. National Arboretum here in Washington, D.C. Sue Martin is curator of all the National Arboretum's conifer collections, including the Gotelli, and is one of our foremost authorities on the subject. Working on the plans for the new Visitor Center garden and visiting Sue's collection for inspiration got me started thinking about the generosity of spirit that exists among all of us who garden.

There may be a few gardeners who over the years have kept a secret or two, but as a rule we are sharers. Our gardens are open books, intended to be read, and we know intuitively that the only ideas we have that ever go anywhere are the ones we pass along. This beneficence is really what the American Horticultural Society is all about: spreading the word about the most up-to-date gardening information and sharing knowledge with gardeners new and experienced.



A variety of small conifers will eventually be added to the landscape around River Farm's new Visitor Center.

Last fall, for instance, intern Mohamad Chakaki joined us for the last stages of the growing season and stayed on to develop a "conifer walk"—a self-guided tour of the many conifers here at River Farm that he has left for future visitors to enjoy. After completing his work with us in December, he followed the sun to Arizona for a second internship before moving, in April, to still a third internship back here at—of all places—the National Arboretum, where he is specializing in dog-

woods and, once again, in conifers.

This is not just a cycle of coincidence. We gardeners often move in the same circles because we have so much to learn from and to teach each other. So I doubt it will come as too much of a surprise if I tell you that Sue Martin is the curator with whom Mohamad is currently working, and that she has a featured article on native conifers in this very magazine issue (see pages 33 to 37).

Our collective resources are truly spectacular, and the generosity of spirit among gardeners makes them accessible to a degree that must be the envy of other disciplines. No two gardens are the same, so there is something to be learned from each.

As for Mohamad, he was back here volunteering at River Farm just the other week as if he'd never been away. When you come right down to it, our world is all one big garden, really, that we work in together, and it's pleasant for all of us to go forward in such good company.

*Janet Walker is director of horticulture at River Farm.*

**HOLIDAY DECORATIONS:** In what has become an annual holiday tradition at River Farm, the ground floor of the American Horticultural Society's historic Main House will be colorfully decorated with a variety of trees, poinsettias, and other seasonal trimmings. This year the evergreen trees will again be resplendent with an array of wonderful and whimsical sets of handcrafted ornaments that are on loan from the Smithsonian Institution's archives.

These one-of-a-kind ornaments are part of the Smithsonian collection of historic decorations that once graced holiday trees at the Smithsonian's museum buildings and at the White House. Each set follows a theme and many of the ornaments are creatively constructed of unusual materials.

The holiday decorations will be on display from December 7 through New Year's Day. River Farm is open to the public from 8:30 a.m. to 5 p.m. weekdays except holidays. For additional information about the holiday display or for directions to River Farm, please call (703) 768-5700, ext. 0.



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**Garden Paths:** "The Perfect Pathway," Sept./Oct., 26.

**Garden Tools:** "Adaptive Garden Styles and Tools," May/June, 16.

**Gardeners Information Service:** Asparagus, Sept./Oct., 13. Begonias, July/Aug., 13. Broad beans, Mar./Apr., 15. Climbing roses, Nov./Dec., 15. Coffee plants, Sept./Oct., 13. Dogwoods, May/June, 27. Earwigs, July/Aug., 13. Favorite plants, Nov./Dec., 15. Ficus, Sept./Oct., 13. Fire blight, Mar./Apr., 15. Japanese yews, Jan./Feb., 21.

Oriental lily, Sept./Oct., 13. Rhubarb, May/June, 27. Shade gardening, May/June, 27. Soil sifters, July/Aug., 13. Swedish ivy, Nov./Dec., 15. Sweet potato vines, Jan./Feb., 21. Tree ferns, Jan./Feb., 21. Voles, Mar./Apr., 15.

**Greenhouses:** "Winter Wonderland," Jan./Feb., 47.

**Habitat Gardening:** "Edge Habitats," Jan./Feb., 28. "Natural Inspirations: California," Mar./Apr., 16.

**Internet Gardening:** "Cyber-Gardening," Jan./Feb., 13.

**Lady Beetles:** "Living Harmoniously with Lady Beetles," Sept./Oct., 14.

**Lewis and Clark:** "The Plants of Lewis and Clark," Nov./Dec., 38.

**Native Plants:** "America's Wisterias," May/June, 43. "Berried Treasures," Nov./Dec., 26. "Bok Tower Gardens," Nov./Dec., 44. "Cobra Lily," May/June, 18. "Edge Habitats," Jan./Feb., 28. "Legacy in a Nutshell," Sept./Oct., 44. "Native Conifers," Nov./Dec., 33. "Natives for the Edible Landscape," July/Aug., 41. "North American Annuals," May/June, 31. "The Plains Garden: Denver Botanic Gardens," Sept./Oct., 16. "Plants That Turn Up The Heat," Jan./Feb., 22. "The Plants of Lewis and Clark," Nov./Dec., 38. "A Prairie-Style Front Walk: Illinois," May/June, 24. "Tennessee's Treasured Coneflower," July/Aug., 14.

**New Jersey Pine Barrens:** "Beauty In The Barrens," May/June 36.

**Nut Trees:** "Legacy in a Nutshell," Sept./Oct., 44.

**Peckerwood Garden:** "Peckerwood," Jan./Feb., 43.

**Plant Breeding:** "Breeding Plants for the Future," Sept./Oct., 18.

**Plant Exploration:** "All in a Day's Work: Two Tales from the Field," July/Aug., 24. "The Plants of Lewis and Clark," Nov./Dec., 38. "Seeking New Plants for American Gardens," July/Aug., 18.

**Prairie Plants:** "The Plains Garden: Denver Botanic Gardens,"

Sept./Oct., 16. "A Prairie-Style Front Walk: Illinois," May/June, 24.

**Prospect Park:** "Prospect Park," Sept./Oct., 49.

**Pruning:** "Renewal Pruning for English Boxwood," Nov./Dec., 48.

**River Farm:** "Angels in the Garden: River Farm's Interns," Jan./Feb., 62. "Meadow, Grove, and Stream," Sept./Oct., 62. "Old, New, Borrowed, Blue," Mar./Apr., 62. "Tasteful Displays," July/Aug., 62. "Victorian Style Comes Full Circle," May/June, 62. "What Goes Around," Nov./Dec., 61.

**Senior Gardening:** "Adaptive Garden Styles and Tools," May/June, 16. "Maturity in the Garden," May/June, 11.

**SMARTGARDEN™:** "Garden Clean-Up," Nov./Dec., 9. "Mulch," Sept./Oct., 9. "Organic Matter," May/June, 7. "Soil pH," Mar./Apr., 10. "Water Conservation," July/Aug., 9.

**Southwestern Plants:** "Cold-Hardy Cacti," Mar./Apr., 45. "Peckerwood," Jan./Feb., 43.

**Spiders:** "Conquering Arachnophobia," May/June, 22.

**Toad Lilies:** "Falling for Toad Lilies," Sept./Oct., 38.

**Tricyrtis:** see Toad Lilies.

**Urban Gardening:** "Indoor Composting: A Worm's Eye View," Nov./Dec., 16. "Prospect Park," Sept./Oct., 49. "Seeing the City for the Trees," July/Aug., 16.

**Violets:** "Native Violets," Mar./Apr., 27.

**Western Plants:** "The Plants of Lewis and Clark," Nov./Dec., 38.

**White, Elizabeth:** "Beauty in the Barrens," May/June, 36.

**Wilder, Louise Beebe:** "Louise Beebe Wilder," Mar./Apr., 33.

**Windflowers:** "Windflowers," Mar./Apr., 38.

**Wisterias:** "America's Wisterias," May/June, 43.

**Worms:** "Indoor Composting: A Worm's Eye View," Nov./Dec., 16.

**Zoo Horticulture:** "The Greening of Zoos," Sept./Oct., 33.

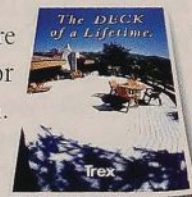


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