

# THE AMERICAN GARDENER

A Publication of the American Horticultural Society

July/August 1996 \$3.95



- TRUE BLUE BLOOMS** ☉ The Secret of Their Charm
- SEDUCTIVE GREEN FLOWERS** ☉ Treetops to Ground Covers
- PURPLE PEOPLE PLEASERS** ☉ Eye-Grabbing Foliage
- BOSTON'S PLANTMOBILE** ☉ Finding Nature in the School Yard
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*Gardens of**October 29-November 3, 1996**Los Angeles*

SHIRLEY A. KERINS

THIS ONCE-IN-A-LIFETIME PROGRAM features great private gardens in Pasadena, Beverly Hills, Brentwood, Hollywood, Malibu, and San Marino. Many of the gardens are featured in Nancy Goslee Power's new book *Gardens of California: Four Centuries of Design from Mission to Modern*. AHS Board member Robert Volk of San Marino created the itinerary, encouraging AHS members and friends to open their homes and gardens to us. The result is a stunning variety of locations and landscapes. We will stay at the Ritz-Carlton Huntington in Pasadena, which will make a convenient home base for our visits. Leading the program will be AHS President H. Marc Cathey and his wife, Mary, along with AHS Board member Dudley Morgan of Nashville, Tennessee.

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July/August 1996



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**On the cover:** The owner of this California home landscaped to retard fire, but a local law forbidding homeowners to strip their lots of trees allowed fire-prone eucalyptus to remain. Photo by Christi Carter.

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# commentary

"I want a hanging basket for my room," our 11-year-old granddaughter, Emily (Miss Pink), insisted, logically making this request to her plant-oriented grandfather. She and her six-year-old sister, Ellen (Miss Peach), were moving into a home with bedrooms of the same size for each of them. Unfortunately, one room faced north, the other south. After all of my years talking to other people about choosing the right plant for the right location, and they wanted matching flowering plants!

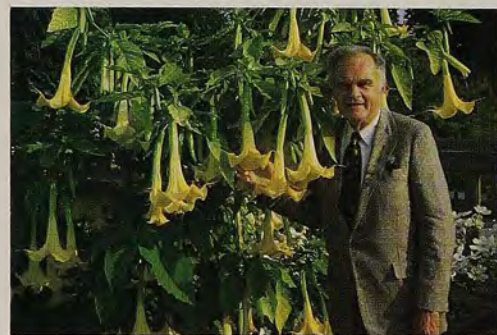
I found it impossible to explain to those young ladies the qualifying statements I would normally use in suggesting a plant to someone. They were not interested in my theories. They wanted the hanging plants selected, purchased, and placed in their rooms on moving day—only three days away. All weekend I drew on all my memories of plants, seeking a solution. As I finished preparing my taxes, phoned friends, watched television, and ate meals, each activity was overshadowed by the need to reach this momentous decision.

*The American Gardener*, with its many departments, features, and photographs, has been designed to serve you in much the same way, inspiring and advising. No one can have enough firsthand experience to offer valid information about all the plants we might possibly grow, and gardeners must be constantly expanding their pool of knowledge by drawing on the experiences of others.

This month, three knowledgeable horticulturists share some experiences and observations about color in the garden. Designer Richard Iversen writes about how to use common wandering Jew and its relatives for a splash of purple foliage outdoors. Robert Geneve, who has written many scientific articles for our magazine, sings the praises of "true blue" flowers and explains why we still don't know how to make a blue rose. Gardener Jack Henning describes some of our many green-flowering plants.

Careful landscaping can also make us safer. California free-lancer Alice Ramirez explains the principles behind firescaping, which can make it more difficult for fire to spread to your home and give firefighters room to defend your property. And from photographer Katherine McGlynn we enjoy the places and faces of GreenThumb, New York City's community gardening program.

By the way, for my little green thumbs I purchased pink and peach guzmanias. They will remain colorful for many months, accept the hot, dry site near the ceiling, and tolerate bright or dim light. I gave each girl a bottle of liquid fertilizer and spoke of weekly waterings. The guzmania flower spikes reminded us of champagne exploding from a bottle when the cork is pulled—an activity we all enjoy—so the plants were a wild success. Let AHS help you put celebration into your own living spaces.



*H. Marc Cathey*

H. Marc Cathey, AHS President





# members' forum

## SEEKING SOLANUM SAGACITY

I have long enjoyed your beautiful publication, which has brought the joys of other people's gardens into my home. What a thrill it was for me to open the February issue and see Marc Cathey's photograph next to what appears to be a *Brugmansia* 'Charles Grimaldi'. I am working on a book titled *Ornamental Solanaceae for North American Gardens* and would like to hear from other readers about their experiences with *Brugmansia*, *Datura*, *Solanum*, and others in this family.

I will send interested members a brief questionnaire and a self-addressed, stamped envelope.

Susi Torre-Bueno  
5680 Dorothy Way  
San Diego, CA 92115-2307  
delatorr@electriciti.com

## TAKE THAT, CAT!

In reply to Flower Hund's letter regarding cats in her garden (February), I have what appears to be an effective way of keeping them from digging and destroying plants. I am a cat lover and have enjoyed being visited by neighborhood cats who, no doubt, find refuge and peace in my dog-free yard. But most gardeners will agree that cats can go where they like provided that space is not enclosed. Therefore it is necessary to teach them that your garden is not for digging. Usually a single, liberal application of cayenne pepper to the areas cats frequent is enough to discourage further damage.

My neighbor's cat liked to hide in my *Salvia leucantha*, leaping out to devour the hummingbirds that visited the purple flow-

ers. One application of pepper flakes (that was what I happened to have in the kitchen at the time) was enough to stop that behavior. Good luck!

Ellen F. Burton  
Monterey, California

## CREATURES OF HABIT

In addition to those plants noted in the January issue, the following seem to be undesirable to deer: *Echinops* (globe thistle), *Helianthus x multiflorus*, *Anthemis tinctoria* 'Kelwayi', *Gaillardia*, *Veronica*, and most herbs. Unfortunately, most writers and nursery people have regarded herbs medicinally or culinarily, but not from the point of view of the usefulness and time of their bloom, so there is little to guide the gardener. *Salvias* seem to be the only exception.

I use commercial deer repellent spray on vegetable plants until they begin to set fruit and the leaves are too old (deer prefer young sprouts). From November through April I use the repellent spray monthly on azaleas, *Hydrangea macrophylla*, and photinia because I insist on having them in deer territory. The deer start looking in other places, although this is not perfect. Being creatures of habit, they do check back occasionally.

Betty Stacey  
McLean, Virginia

## A SHINGLE SOLUTION

In the January 1992 *American Rose Magazine* (the publication of the American Rose Society) Leonard Veazey, grounds supervisor at the American Rose Center in Louisiana, reported great success in dis-

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## We Need Your Help!

The American Horticultural Society has a new public relations department. Until we build up momentum, we will not need a formal arrangement with a clipping service to send us press coverage from outside the Washington metropolitan area. But we would love for our members to let us know of any articles about AHS that appear in their local newspapers or other publications. Send clips to Mary Ann Patterson, AHS, 7931 East Boulevard Drive, Alexandria, VA 22308-1300, or fax to (703) 765-6032.



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## Start Thinking Seeds!

DO YOU HAVE PLANTS YOU CAN SHARE with other American Horticultural Society members through our annual seed exchange? It's not too soon to start thinking about seed collection. Tips on collecting seed, and the form to mail in with your seeds, will appear in our Annual Report, to be mailed in September. That "members-only" issue will also contain our fall seed catalog. Watch for it!

couraging deer by using the standard deer repellent Hinder, but in a new way: He filled small containers with slightly diluted Hinder, set them at spaced intervals among the roses, and covered the containers loosely with pieces of cedar shingle.

Living in deer-infested Mercer County (New Jersey), I was desperate for solutions to this problem. Most of my property is protected by a six-foot, solid wooden fence (ultimately the only total protection). But I wanted to protect plantings outside the fence as well. I spaced my containers about six feet apart, partly buried for stability and loosely shielded from rain with the cedar shingles. I am happy to report that it seems to work remarkably well, so long as you keep the solution fresh. I try to remember to change it every three weeks.

Now if someone could only tell me how to rid my gardens and beds of voles! Deer at least have the courtesy to kill plants obviously, from the top down. But the voles can destroy a mature tree in one winter by girdling its bark at ground level.

Stephen C. Bandy  
Princeton, New Jersey

## GROUND COVERS FOR SHADE

I am writing to inquire about possible substitutions for lawn on shady property. We love the look of a beautiful lawn with our perennial garden, but the amount of care, time, and money required seems exorbitant, let alone the wasted resources.

What can you suggest that would not need cutting and fertilizing? I have read about all kinds of solutions in the past, but cannot remember where I read about them. Could you give me some pointers as to where to look and where to purchase the seed necessary?

Thea Amr  
Arlington, Virginia

*It sounds like you are looking for a slow-growing turf substitute such as buffalo grass*

(*Buchloe dactyloides*) that only needs to be mowed a couple of times a summer. Although there is hope that cultivars better suited to the East will eventually be developed, buffalo grass performs best in full sun in the West and parts of the Midwest.

The easiest lawn alternative for a shady eastern garden with acidic soil is moss. Once established it requires no mowing, fertilizing, or even watering. In his article on alternative ground covers in the May/June American Gardener, Andy Wasowski described how to create a moss lawn by blending a small clump of moss with buttermilk and spreading the resulting mixture over the area to be colonized.

You might consider combining a variety of shade-tolerant ground covers. Low-growing evergreen possibilities include the ubiquitous *pachysandra* (for variety try the native *Allegheny spurge* *Pachysandra procumbens*), *wild gingers* (*Asarum spp.*), *lilyturf* (*Liriope spp.*), *mondo grass* (*Ophiopogon spp.*), and *bugleweed* (*Ajuga spp.*). *Virginia creeper* (*Parthenocissus quinquefolia*) will naturalize as a ground cover, but is deciduous and will attempt to climb trees. Slightly taller choices include many selections of *hostas*, *iris*, and low-growing ferns. A simple mulch path will allow you to traverse beds of these ground covers.

Several often-recommended ground covers are potentially invasive and should be avoided unless they can be contained. These include the colorful *Houttuynia cordata* 'Chameleon', *dead nettles* (*Lamium spp.*), *creeping Jennie* (*Lysimachia nummularia*), and *sweet woodruff* (*Galium odoratum*). Whatever you do, don't fall for the lure of the "quick fix" *English ivy*; garden writer Allen Lacy astutely describes it as "a Trojan horse in a garden."

A good source of ideas for ground covers is Stevie Daniels' *The Wild Lawn Handbook: Alternatives to the Traditional Front Lawn*, available through the AHS Book Service.

Send letters to: Editor, *The American Gardener*, 7931 East Boulevard Drive, Alexandria, VA 22308-1300, or e-mail to GardenAHS@aol.com.

## Correction

The address and telephone number for Heronswood Nursery were incorrect in our May/June "Mail-Order Explorer." The correct address is 7530 N.E. 288th Street, Kingston, WA 98346-9502. Call them at (360) 297-4172.





# offshoots

## MOON PIE

by Rand B. Lee

When I met my gardening companion, Moon Pie, I was living off Santa Fe's main business drag at the back of a musical instrument maker's shop. There was no garden, but there was a field and, beyond it, a huge arroyo that ran for miles through the city. One year earlier my best friend, Alex, who had AIDS, had committed suicide. On the anniversary of his death, in the middle of winter, I walked into the local animal shelter seeking a new companion to fill some of the void. There was the dog of my heart, lying on his side in a cage. He was only seven months old, a husky mix shaped like a German shepherd, white with a gray streak down his back and an odd upturn to his nose. His left eye was brown and his right eye sky blue. Someone had found him dying on the street just that day, a car-struck, nameless stray. His right shoulder, right leg, and the right side of his head were severely abraded, and his pelvis was cracked.

I left, wondering if I was really ready for the responsibility of a pet. I did not have much time to decide. Pound policy called for strays to be euthanized if they were not adopted within three days. That night I fell asleep with the moon streaming through my window and dreamed the white dog was lying curled in front of my space heater. The next day, I went back and paid the adoption fee. By this time the dog was so weak he could not raise his head. "If you're going to die," I said to him, "you're going to die in a loving home." I loaded him into the front seat of my car. On the way back to the granny flat, I felt something touch my right hand. I looked down and saw that it was my dog's tongue. I knew then he would not die.

I named him Blue Moon—"blue" for his blue eye, "moon" because the moon is seen in mythic archetype as a symbol for the unconscious. I felt that somehow he was a mirror of all the feelings that I had buried for so many months. In three days he could stand enough to go outside to urinate; in a week he was exploring the yard; in a month he was running madly around the field and leaping over me as I lay laughing, watching him. I had not laughed for a year.

We played tug-of-war. Moon howled like a wolf when I was out of sight. When I came home from an errand, he rushed up to me and, as I knelt to embrace him, chewed my lower lip in

greeting. We explored the arroyo together. The flat suddenly seemed unbearably drab and confining; in the fall of 1989 we moved to a larger place closer to town center, a house with a 300-square-foot yard. Somewhere around that time, I dropped the "blue" from Moon's name and added "pie" as an endearment, as in "sweetie-pie."

The back yard was concrete-hard alkaline clay with waist-high weeds and two languishing apple trees. My mother had taught me to garden in Connecticut, where I grew up, but nothing had prepared me for Santa Fe's arid conditions. I quickly learned the value of drip systems and mulch. That spring, I laboriously scraped out my first beds in the warm

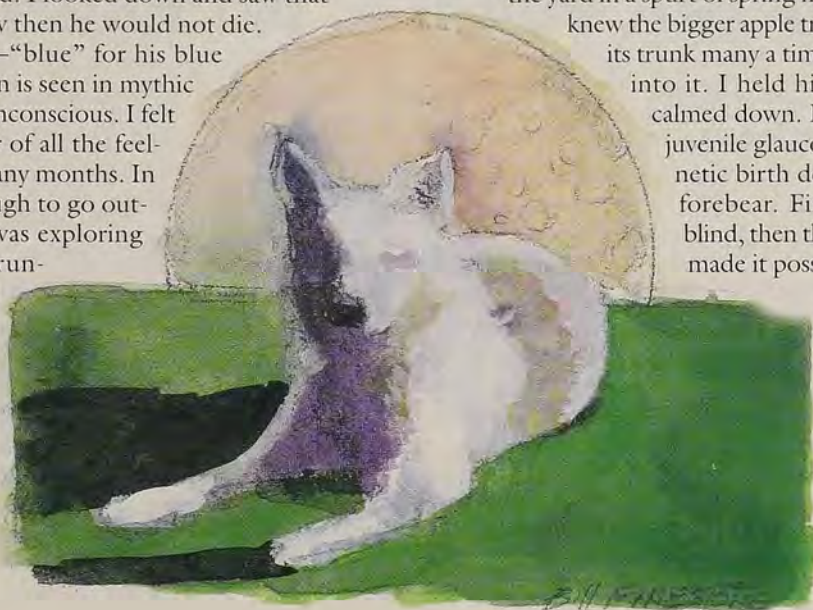
**On the anniversary of my friend's death I walked into the animal shelter seeking a new companion to fill some of the void.**

south-facing ell of the house, dug in bagged mushroom compost, and planted a square herb garden with lavender in the center. Over the next year, I dug up more of the yard and added flower beds. Moon Pie, meanwhile, doubled in size, raced everywhere, forgot how to howl as cubhood left him, ate the cottonseed meal I fertilized the lavender with, and chased the cats that came into the yard. And when he was one and a half years old, he began to go blind.

The morning I realized it, he had been racing full tilt around the yard in a spurt of spring madness, and though he knew the bigger apple tree well, having peed on its trunk many a time, he smashed head-on into it. I held him close to me until I calmed down. He was diagnosed with juvenile glaucoma, an inoperable, genetic birth defect from some husky forebear. First the blue eye went blind, then the brown. An operation made it possible to look at the blue

eye, although it was glazed and slightly shrunken, without wincing.

But the brown eye swelled with fluid, then began to decompose. Moon became more and more lethargic. He was clearly in enor-



BILL FIRESTONE



mous pain; the vet said he probably had been since the swelling began. "Animals," he added, "are stoic." I am not. I had the vet remove the eye and sew the lids together.

I felt to blame for not having saved Moon from blindness, just as I felt to blame for not having saved Alex. But the morning after the operation, I looked outside and there was Moon, leaping up into the air with his tail wagging wildly, for sheer joy.

That first manic month he dug four dens: a shallow hole behind the globe thistle next to the south wall of my yard; a deeper hole, across from the globe thistle, between the tea rose 'Tiffany' and the butterfly bush; another to the left of the back door leading into the garden, smack in the center of a new planting of lavender; and a fourth on the opposite side of the stoop from the lavender. As each hole appeared, I progressed from amused acceptance to irritation to loud scolding to furious tears.

When I found the fourth hole, I sat down and thought about it. Moon Pie, being a dog, was a natural den maker, and being a blind dog, he was teaching himself about edges and the safety of them. Lying in a hole with his back to a warm wall obviously made him feel secure. I surveyed the yard. I had dug so many flower beds there was little space for him to roam about without bumping into something. To remedy this, I filled in all but two of the flower beds on the right side of the yard and declared the resulting open space no-man's-land, for blind dogs only. I planted perennial Maximilian sunflower there, and costmary, which grew into thickets just right to hide in. I opened the door to my three compost heaps, which I have always been too lazy to irrigate and turn properly, so that Moon

Pie could revel in the olfactory delights of rotting melon rinds. Somehow, he got the message. He does not dig in the flower beds any more. Well, hardly ever.

Moon Pie is eight years old now and cannot possibly remember ever having seen. He likes to sit near me while I dig and weed, but he shows absolutely no interest in anything I plant. Roses and lavender do not stir him. It is what I put under the ground that intrigues him, particularly if there is cottonseed meal or horse manure in it. He no longer runs; the apple tree put a stop to that. When he has too much energy to handle, he chases his tail in the tightest imaginable circle. In winter, his favorite time of year, he takes his bone into the garden, and I watch him jump into the air, up and down, tossing his bone and missing the catch and snuffing for it and tossing it again. Having no hands, he is under no illusion that he can control his reality. He accepts what comes, as the moon accepts the light of the sun. I watch him and wait for the same freedom.

*Rand B. Lee is president and founder of the American Dianthus Society and co-editor of The American Cottage Gardener.*

Many who attempt to garden with dogs have, like Rand Lee, been moved near "furious tears" by the experience. Writer Brenda Beust Smith and dog trainer Frances Burke Goodman, in a 14-page booklet full of tips, offer hope that we too can attain peaceful co-existence. Send \$6.36 to: *Gardening With Dogs*, River Bend Company, 50 Briar Hollow Lane East, Suite 620, Houston, TX 77027.

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10210 Leatherleaf Court, Manassas, VA 22111





# gardeners' information service

**What causes fasciation?** I have seen fasciated willows, but had never seen a fasciated peony until last year. In recent years my peonies have also been attacked by leaf black spot and had fewer blooms. Could this condition have caused the fasciation, or could an herbicide I used nearby have caused the problem? —P.A., Radford, Virginia



Fasciation is a distortion of plant tissue that can be caused by mechanical or chemical injury, or by bacterial or fungal infection. Plant cells multiply abnormally, resulting in flattened or sometimes spirally curved shoots. It may appear as if several stems are fused. Among the plants commonly affected by fasciation are sweet peas, chrysanthemums, tulips, marigolds, and willows.

The inadvertent application of an herbicide could have caused the fasciation of your peonies, but if that was the case you're lucky to have escaped with only minor damage. Herbicides should not be used where there is any chance of drift or splashing onto ornamental or vegetable crops.

Black spot is a fungal disease most commonly seen on roses. More likely your peonies are afflicted with a similar ailment variously called leaf blotch, measles, or red stem spot. This disease usually first manifests itself as dark purple spots on the surfaces of upper leaves.

Fungal diseases can usually be controlled by immediate removal of diseased leaves, followed by removal of all leaves and stems in late fall. Plants that are severely infected every year may require application of copper or lime sulfur sprays weekly early in the growing season. Recent research indicates that dousing plants with dilute compost tea may help prevent some fungal diseases.

Fewer blooms on your peonies could be the result of chemical stress or disease, or merely an indication that they need to be dug up and divided in late summer. Always leave two to three eyes (nascent shoots) and at least one eight-inch section of root per division. Plant divisions so that the uppermost eyes are no more than two inches below ground level.

**How do I germinate pecan nuts?** I have nuts from a very prolific tree from Texas and would like to see if I can obtain some seedlings. —T.N., Philadelphia, Pennsylvania

Pecans should be planted in early spring after cold treatment for at least three months. Recommended planting depth according to our references range from three-quarters of an inch to three inches; plant the seeds six to eight inches apart.

There are two reasons, however, that you may want to rethink the idea of growing them from seed. First, the minimum seed-bearing age is 10 to 20 years. Second, assuming that the tree you describe is the unimproved native pecan, *Carya illinoensis*, it is unlikely to be as prolific in your home state. Although pecan trees will grow in our Northeast, they do not usually produce filled nuts. You may want to consider planting a grafted tree. Two cultivars recommended for northern growers are 'Colby' and 'Peruque'.

**Our local supermarket frequently displays vegetables labeled "malanga" and "yuca." Could you tell me a little about them and explain how they are eaten?**

—A.P., Providence, Rhode Island

Malanga and yuca are popular root crops in the Caribbean and South and Central America. Malanga (*Xanthosoma* spp.)—also known as yautia, tannia, and cocoyam—is related to, and sometimes confused with, the more familiar taro (*Colocasia esculenta*). There are approximately 40 species of *Xanthosoma* native to the American tropics. Weighing from one-half to more than two pounds, these tubers are roughly club shaped with a shaggy brown skin. The interior is creamy yellow or pink, with a crisp yet slippery texture and a flavor described as nutty or earthy. Elizabeth Schneider, author of *Uncommon Fruits and Vegetables: A Commonsense Guide*, writes that malanga is usually peeled and boiled in salted water for 20 to 25 minutes, then served much like a boiled potato. She lists recipes for malanga chips, pancakes, and fritters.

Yuca (pronounced YOO-kuh)—also called cassava, manioc, and tapioca—is the swollen root of an ornamental tropical shrub or small tree called cassava (*Manihot esculenta*). Native to Brazil, cassava is now cultivated widely throughout the Southern Hemisphere. Shaped like sweet potatoes, individual yuca roots measure two to four inches in diameter and can weigh up to three pounds. The tough, barklike brown skin is difficult to peel, but can be sliced off to reveal the hard white flesh beneath. When cooked, the flesh becomes glutinous and translucent. Rather bland on its own, yuca is used as an additive in many dishes, including soups, stews, breads, and desserts. Americans are most familiar with yuca as the thickening agent in tapioca pudding.

**I recently purchased a Japanese persimmon, and a reference I consulted said it could produce parthenocarpic fruits. Does this mean it is self-pollinating?**



—C.A., Waynesboro, Pennsylvania

Japanese persimmon (*Diospyros kaki*) is parthenocarpic, which means it is capable of producing mature fruits without benefit of fertilization, or sometimes even of pollination. The resulting fruits will then be seedless. If you planted your tree with other Japanese persimmons, however, cross-pollination will likely occur and the fruits will bear seeds.

The term "parthenocarpic" is derived from the Greek roots *parthenos*, which means "virgin," and *karpos*, which means "fruit." Notable examples of parthenocarpic fruits include navel orange, banana, and pineapple. Brian Capon, author of *Botany for Gardeners*, notes that not all seedless fruits are parthenocarpic. Some seedless grapes, for instance, develop after pollination and fertilization, but embryos abort before seeds enlarge.

—Neil Pelletier, Director  
Gardeners' Information Service





# planting the future

## ECOSYSTEMS ON WHEELS

by Cynthia Davis Klemmer

When children can explore and make observations for themselves, learning the basic aspects of plants can become fascinating triumphs. The Massachusetts Horticultural Society's Plantmobile is designed to bring those opportunities to every student in Boston.

The Plantmobile is a traveling plant science education workshop that provides informal, hands-on plant science education programs for children in kindergarten through sixth grade. The vehicle, which began making visits in 1991, is a Chevy van that has been custom-fitted with a fiberglass "box." As the society's children's education coordinator, I usually lead each Plantmobile school visit along with one or two volunteers. Most schools schedule four one-hour sessions per trip so several classes can participate. The Plantmobile averages three visits each week in the spring and fall and reaches approximately 4,000 schoolchildren each year.

Every Plantmobile visit begins with a visual tour of the Plantmobile murals. The variety of plants and animals on the murals creates a virtual "Where's Waldo?" of search-and-finds.

One side of the Plantmobile features a tropical rain forest. Lush greenness draws the eye in, revealing a monkey's-eye view of tropical flowers and creatures in the canopy layer. A tree frog scrambles amid a yellow-flowered *Clusia*, while on the ground the long arching leaves of a heliconia provide shelter for a tent-making bat. The cannonball-like fruit of a monkey-pod tree dangles in the top right corner of the mural.

On the other side of the Plantmobile, a more familiar scene unfolds—a wetland ecosystem in autumn right here in New England. Muskrats feed on cattail shoots, while a red-winged blackbird nests just above them. A carnivorous pitcher plant and sundew at the water's edge wait to lure insects into their sticky traps. A mayfly hovers precariously above them.

Because the Plantmobile allows outdoor explorations and discoveries to take place on "familiar turf," the things students learn become more relevant to their daily lives, just as the other mural brings home the

lessons of the rain forest. Programs vary from year to year to keep the students interested. Those currently offered include:

**SCHOOL YARD ECOLOGY.** In small teams, students survey a section of the school yard and examine it as part of an ecosystem. Students practice working together, using scientific tools, making observations, and recording data. This often results in students re-evaluating previously held concepts about their school yard.

**FLOWER TO SEED ... AND BACK AGAIN!** Students study the life cycle of a plant by dissecting seeds, flowers, and fruit, and find out what links these objects together.

Being encouraged to rip a flower apart is a novel experience for most elementary students and one that they find quite interesting. They explore "plant parts" that they eat everyday and ponder the "Is-it-a-fruit-or-a-vegetable?" question for themselves.

**SQUIRMING AROUND.** Through hands-on exploration of redworms (*Eisenia foetida*), students discover the decomposition cycle and the crucial services worms provide for plants, creating fertilizer with their castings and aerating the soil with their tunneling. Students later create their own classroom worm bin for continuing study and observation.

While the Plantmobile is used predominantly for school outreach programs, it is also used for community festivals and celebrations, as well as library and garden club programs. It is featured each year in the Discovery Center at the New England Spring Flower Show. The Plantmobile now costs \$100 per one-hour session.

While this price is comparable to other museum outreach programs in the area, the society hopes to find a program sponsor so that schools with smaller budgets will also have access to the Plantmobile.



The Plantmobile's colorful murals appeal to all ages.

For more information on the Plantmobile or other MHS programs, such as Teacher Training or New England Spring Flower Show children's programs, call Cynthia Davis Klemmer at (617) 536-9280 ext. 227.

Cynthia Davis Klemmer became involved in children's horticulture through the first American Horticultural Society Youth Gardening Symposium in 1993 and made a presentation about the Plantmobile at this year's symposium at Callaway Gardens.

COURTESY OF CYNTHIA DAVIS KLEMMER





# natural connections

## THE YUCCA MOTHS

by Peter Loewer

A great number of American plants were exported to Europe during the 16th century, including tobacco, potatoes, nasturtiums, sunflowers, and yuccas. In 1629, John Parkinson (1567–1650), one of England's great botanists and the apothecary to King James I, published his monumental book *Paradisi in Sole Paradisus Terrestris*, which is devoted to plants for "a garden of delight and pleasure." He wrote of the Indian yucca as "a rare Indian plant [that] hath a great thicke tuberous roote [spreading in time into many tuberous heads] from the head whereof shooteth forth many long, hard, and guttered leaves, very sharpe pointed of a greyish greene colour, which doe not fall away, but abide ever green on the plant." Along with this accurate description is a beautiful woodcut showing a branch of flowers engraved by a hand that is very fine indeed.

Following the description is the news that the yucca first came to England from the West Indies by way of a servant who gave it to his master, Thomas Edwards, an apothecary in Exeter.

The word *yucca* is said to come from *yuca*, Spanish for the manihot (*Manihot esculenta*), a major source of the bitter cassava, itself based on a Taino Indian word for this plant. Although used in error, the name stuck. There are about 40 species native to the warmer regions of North America, many of which have now spread throughout the country. They all belong to Agavaceae or the century-plant family.

Most people are familiar with these very imposing plants with their sword-shaped leaves—often possessing very sharp points—because the yucca has been used in the landscape for hundreds of years. But few people realize that its tall spires of white, summer-blooming, bell-shaped flowers are pollinated in its native desert home at night by a species of moth. The same agent of pollination—though sometimes of a different species—does the job in many of the new areas where the yucca has settled.

### STRANGERS IN THE NIGHT

Yuccas are not specifically night-blooming plants because the flowers are open during the daytime hours. But the flowers exhibit nyctinasty; in other words, they move about at night.

During the day, the white, six-petaled blossoms hang down like bells at rest. At dusk, they turn up to the evening sky, open wide, and release a sweet, soapy smell to the night air. The reason for this behavior comes in the form of a particular genus of moths—the yucca moths, *Tegeticula yuccasella* (synonym *Pronuba yuccasella*).

According to Holland's *Moth Book*, in 1872 Professor C. V. Riley discovered the relationship between these moths and the yuccas. He proved that the pollination of the flowers and the development of fruit was not an accidental meeting of insect and



A moth deposits her eggs while pollinating a yucca flower.

pollen. Instead, he showed it was the result of an insect purposely collecting pollen with a mouth modified by nature for the task and the subsequent application of the pollen to the stigma of a yucca flower. All this was done for the yucca to produce seed and the moth progeny to have food upon hatching.

The female moth enters the yucca flowers at night and, with a specially modified first joint of her extended jaw or maxillary palp, is able to roll the pollen in a tight ball. This is held under the moth's head as she flies to another flower. Here, the moth clings to a few staminal filaments and, with her ovipositor, neatly lays her four to five eggs in the side of the pistil. She then pushes the pollen ball into the funnel end of the stigma and ensures pollination.

A few days later, the moth eggs hatch, and larvae move into the blossom's ovary, where they consume 18 to 20 seeds and gain enough strength to eat through the ovary's wall to the outside. Once out, they use a self-produced thread to lower themselves to the ground, where they burrow into the earth to complete a juvenile existence before emerging as full-grown moths. The hundred or so seeds not consumed by the larvae ripen to guarantee another generation of the yucca. Because most yucca flowers are incapable of self-pollination—their pollen is puttylike, and the anthers and stigmas would never touch—without the intervention of this particular moth, the plants would have perished eons ago.

*Tegeticula yuccasella* pollinizes the blossoms of *Yucca filamentosa* in the East and does the same in the West for *Y. glauca* (formerly *Y. angustifolia*), whereas *Y. brevifolia* (the Joshua tree) is pollinated by *Tegeticula synthetica*, and *Yucca whipplei* is pollinated by *Tegeticula maculata*.

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# urban gardener

## OUTER SANCTUMS

by *Nikole Williamson*

While modern American churches may offer a calm refuge within their walls, some of their “gardens” are sterile landscapes no more welcoming than those around the county jail. Two churches attempting to bring the spirit of Sunday morning to their grounds are Central Church of Christ in Del Rio, Texas, and Heritage Presbyterian Church in Alexandria, Virginia. Members of these congregations have created two very different gardens with similar results. Both provide a quiet retreat as well as an opportunity for community education.

The garden at the Central Church of Christ was begun in the spring of 1987 by Marguerite Chanstor with the help of her husband, Ed, following completion of a new church building. The parking lot for the new facility covered nearly three-quarters of a city block, and when it was graded, additional land—a 70-foot-wide perimeter on three sides—was also cleared of vegetation. Volunteer plants were the inspiration for what is now a garden of primarily Texas natives, located on the edge of USDA Zones 8 and 9 in the southwest part of the state.

“When things started coming up, I began watering the ones that looked interesting,” Chanstor says. Not too long after, a couple of prominent church members died, and their families donated native oaks as memorials. Although the garden still had no formal plan, Chanstor continued to selectively water and started removing undesirable weeds. She began to place rocks and timbers around plant groups for definition and to create paths. “The garden just evolved,” Chanstor says. “We went with what came up, and if a place stayed bare, then we added something.”

Next Chanstor looked for plants that could add texture and color, planting a dozen 10- to 12-foot native palms (*Sabal* sp.), plus Texas bluebonnet (*Lupinus texensis*), Indian paintbrush (*Castilleja* sp.), Mexican hat (*Ratibida columnifera*), and Mexican marigold (*Tagetes lucida*).

Chanstor now considers the garden established. She and another volunteer weed two mornings a week. Both the congregation and the community enjoy their efforts. Children cut through on their way to school, and birders are excited by the growing numbers of avian visitors as the trees get larger. “Our church garden is

not advertised anywhere,” Chanstor says, “but people find out about it if they’re interested in native plants and gardens.”

## LIVING CATHEDRAL

The Heritage Presbyterian Church in Zone 7 in Northern Virginia is far removed from the Texas plains, and its garden reflects that. The church has set aside three-and-a-half acres to preserve an existing woodland and develop a meadow of wildflowers and native grasses. Its inspiration is reflected in its name: the Creation Awareness Center Living Cathedral.

In the fall of 1990, congregation members conducted a class on “Keeping and Healing the Creation” to focus on the church’s responsibility for the environment. An offshoot of the class, Friends of Creation, advocated preserving the woodland and using church property to demonstrate ways to care for the earth.

Volunteers used mulch to better define existing trails, cleaned up litter, built compost bins, and erected signs. They hope to eventually re-introduce native woodland species, but so far are still trying to eradicate English ivy.

According to volunteer Barbara Mintmire, if a tree falls and it’s not blocking a trail, they leave it. “We want this to be as close to nature as you can get in suburbia.”

Work on the wildflower meadow began in the spring of 1992 with sowing of a prepackaged seed mix. This planting did well the first two years, but eventually the less hardy annuals failed to reseed and grasses reclaimed the area. Ed Peterman, another volunteer, is now controlling grasses with an herbicide and planting bare patches with native wildflowers.

“We hope that by using natives, they will have a better chance of surviving the winters,” Peterman says. “We don’t encourage people to use herbicides, but have found it was the best way to keep the grass out of here while the flowers get established.”

The Living Cathedral is open to anyone, anytime, and is frequently used by classes from a nearby elementary school, local Girl

Scouts, and neighbors out for a stroll. The church provides meditation guides that include information on the trees, plants, and wildlife in the woodland. The guide reads, “As city dwellers we have become distanced from the land... We are like strangers in this place.” Such church gardens may be changing that.

*Nikole Williamson is editorial assistant for The American Gardener.*



Children dance in the Heritage Presbyterian Church garden.

COURTESY OF HERITAGE PRESBYTERIAN CHURCH



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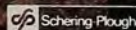
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# mail-order explorer

## FLIGHTS OF HORTICULTURAL FANCY

by David J. Ellis

Arborvillage Farm Nursery in Holt, Missouri, is in a region one of its customers calls “the hell zone,” where summer temperatures have reached 120 degrees with high humidity, winter temperatures have dipped to 30 below, and snow cover is unpredictable.

Yet the nursery’s location is a boon for those seeking plants acclimated to Midwestern extremes. “I can get a tremendous variety of plants if I send out to the Pacific Northwest or South Carolina,” says Christine Kurtz Fuerhoff, a Master Gardener who volunteers at the Missouri Botanical Garden in St. Louis, “but having a resource like this in my back yard is something I consider unique.”

Martin Schultz, grounds manager for the Sisters of Charity of St. John Antida in Milwaukee, Wisconsin, says he started ordering from the nursery because he “figured it was a lot colder than some of the West Coast nurseries, so the hardiness would be closer to what we need here.”

Gardeners not only in the Midwest but on both coasts are beginning to discover the rich variety of shrubs and trees available at Arborvillage. Frank Franco, a high school teacher in Rome, New York, says Arborvillage “sends stocky plants that you can put right in place without a lot of babying.” A particular success has been a white, double-flowered cultivar of the mazzard cherry (*Prunus avium* ‘Plena’). “I couldn’t believe something that looks so delicate could survive here in the northern part of [USDA] Zone 4.”

Steve Campbell, a third-generation nurseryman from Sebastopol, California, has enjoyed *Sambucus nigra* ‘Pulvurentula’, a cultivar of black elder that has purple leaves splashed with white, and ‘Black Velvet’, a heavy-blooming, dark purple-leaved cultivar of smoke tree (*Cotinus coggygria*). “Everything they grow has done pretty well for me here,” says Campbell.

Arborvillage owner Lanny Rawdon spent most of his life flying for Braniff Airways before turning his tree-growing hobby into a vocation. “I was more or less born in a cockpit,” quips Rawdon, who grew up with a flying background on one side of the family and a farming background on the other. He learned to fly in high school, taught army pilots to fly, then

did a stint of active duty with the Air Force. While flying for Braniff, Rawdon indulged a growing interest in plants by visiting botanical gardens all over the country during layovers. In 1977 the Rawdons moved to Holt, a small community 40 miles northeast of Kansas City, where they soon established a local nursery and landscaping business. Braniff went bankrupt in 1982, briefly recovered, then went belly up for good in 1989. “Since my children were pretty well grown by that time and I didn’t want to beat my brains out doing landscaping, I decided to pursue a vision I’d had for a while—to provide a broad selection of trees and shrubs that people around the country could collect,” he says. Rawdon and his son Derrick operate the mail-order nursery with wife Sue and a few seasonal workers.

Arborvillage’s catalog is short on color photographs and lurid prose but long on choices succinctly described, including more than 120 maples and dozens of dogwoods, ashes, magnolias, crabapples, oaks, lilacs, lindens, elms, and viburnums. Rawdon has introduced several plants of his own. Next year he will offer ‘Cinderella’, a patented cultivar of *Cornus racemosa*, the panicked dogwood.

Buddy Hubbuch, who retired last year after more than 30 years as horticulturist at the Bernheim Arboretum and Research Forest in Clermont, Kentucky, is another fan. “Most nurseries grow plants people know so they can sell them easily, but Lanny just has a keen interest in plants. He probably has one of the best collections of unusual plants in the country.” Among the many Rawdon has given the arboretum are a pink-flowered cultivar of eastern yellowwood (*Cladrastis kentukea* ‘Rosea’) and an extra-hardy selection of golden-rain tree (*Koeleruteria bipinnata*).

Most Arborvillage customers are in awe of Rawdon’s packing and shipping methods. “I have never seen anything packed like the shipments from Arborvillage,” says Fuerhoff, who has bought plants from dozens of mail-order nurseries. Not only are the plants packed superbly, agrees Franco, but “every plant is a perfect specimen. It’s almost as if he picks out the same plants to send me that I would pick if I was there.”

David J. Ellis is assistant editor of *The American Gardener*.



Arborvillage’s Lanny Rawdon in the greenhouse.

For a catalog, send \$1 to Arborvillage Farm Nursery, P.O. Box 227, Holt, MO 64048. Call (816) 264-3911 to arrange a visit.

COURTESY OF ARBORVILLAGE FARM NURSERY





# conservationist's notebook

## NEW ELMS SHOW PROMISE

by David J. Ellis

The American elm (*Ulmus americana*) is so susceptible to diseases and pests, any tree less steeped in American culture and history would be given up as a bad job. In his *Manual of Woody Landscape Plants*, Michael Dirr notes, "I have often wondered why [American elms] have been treated as royalty when they are so fallible." Yet despite the species' battles with Dutch elm disease, elm yellows, bark beetles, and other foes, researchers have tried for years to develop cultivars that retain the classic vase shape but tolerate some of these pathogens.

Recently, two new cultivars bred for tolerance to Dutch elm disease have been released to wholesale nurseries and arboreta by the U.S. Department of Agriculture's Agricultural Research Service (ARS). Don't go running out to your local nursery, however; it is expected to take a minimum of two years before they are available through retail outlets.

The new cultivars—"Valley Forge" and "New Harmony"—were developed by researchers at the U.S. National Arboretum's laboratory at Glenn Dale, Maryland, from seedlings selected originally at a Delaware, Ohio, test site. "We have screened thousands of American elms," says Denny Townsend, an ARS research geneticist involved with the elm-breeding program for more than 20 years, "and these two are the best we have found so far."

"Valley Forge" is an upright, arching tree with a broadly vase-shaped branching structure and a dense canopy of leaves. Fifteen-year-old specimens from the propagation program are just under 24 feet tall with an average crown spread of 27 feet. "New Harmony" also has a vase-shaped crown, but its trunk divides into several erect limbs. The parent tree—still growing near Springfield, Ohio, at an estimated age of 70 years—is now nearly 80 feet tall with a crown just over 70 feet wide. Both cultivars have the ridged, fissured bark typical of the species and are rated hardy in USDA Zones 5 to 7. "New Harmony" may even be hardy into Zone 4.

"Valley Forge" and "New Harmony" showed significant tolerance to Dutch elm disease in field tests where three-year-old clones of nine American elm

cultivars and selections were inoculated with the disease-inducing fungus. Non-American elm cultivars and American elm seedlings were used as controls.

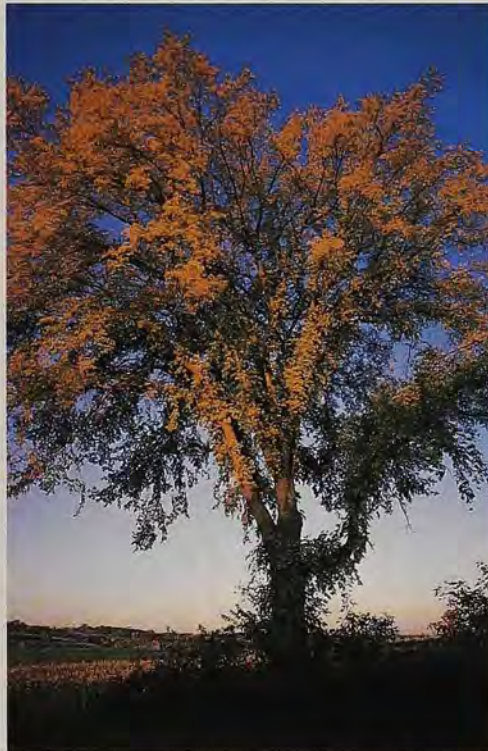
Among other American elms tested were 'Princeton', a cultivar selected in 1922 by William Flemer Jr. of Princeton Nurseries in Allentown, New Jersey; 'American Liberty', developed by Eugene Smalley and Don Lester of the University of Wisconsin at Madison and exclusively distributed by the Elm Research Institute, a non-profit organization based in Harrisville, New Hampshire; and a clone from a breeding program begun at Cornell University in the 1930s.

Four weeks after inoculation, the trees were evaluated for symptoms of Dutch elm disease on their leaves; a year later they were checked for crown dieback. 'Valley Forge' performed best overall, showing less than 30 percent crown dieback. Perhaps the most surprising result of the test was that 'American Liberty', which had previously been

regarded as one of the more disease-tolerant cultivars available, exhibited greater crown dieback (an average of 93 percent) than even the seedling elms used as controls. Because the 'American Liberty' elm is not a single clone, but rather a series of six selections with variable tolerance of Dutch elm disease, Townsend speculates that the more susceptible of the 'American Liberty' clones may have been more frequently represented in the experimental plot. He plans to specifically test 'Independence'—a member of the 'American Liberty' series patented separately from the other clones—in a second trial to begin in the spring of 1998.

Two years after inoculation, the research team was able to isolate the Dutch elm disease fungus from small branch samples taken from four of the tested cultivars, including 'Princeton', and 'American Liberty'. Townsend points out that this finding indicates that elms display "more of a 'tolerance' than a 'resistance' mechanism" to Dutch elm disease.

**A limited number of bud sticks or rooted cuttings of 'Valley Forge' and 'New Harmony' are available to nurseries, agricultural experiment stations, and arboreta. Send written requests to A.M. Townsend, U.S. National Arboretum, USDA Agricultural Research Service, 3501 New York Avenue, NE, Washington, DC 20002.**



The American elm is revered for its shape, despite susceptibility to diseases and pests.

David J. Ellis is assistant editor of *The American Gardener*.

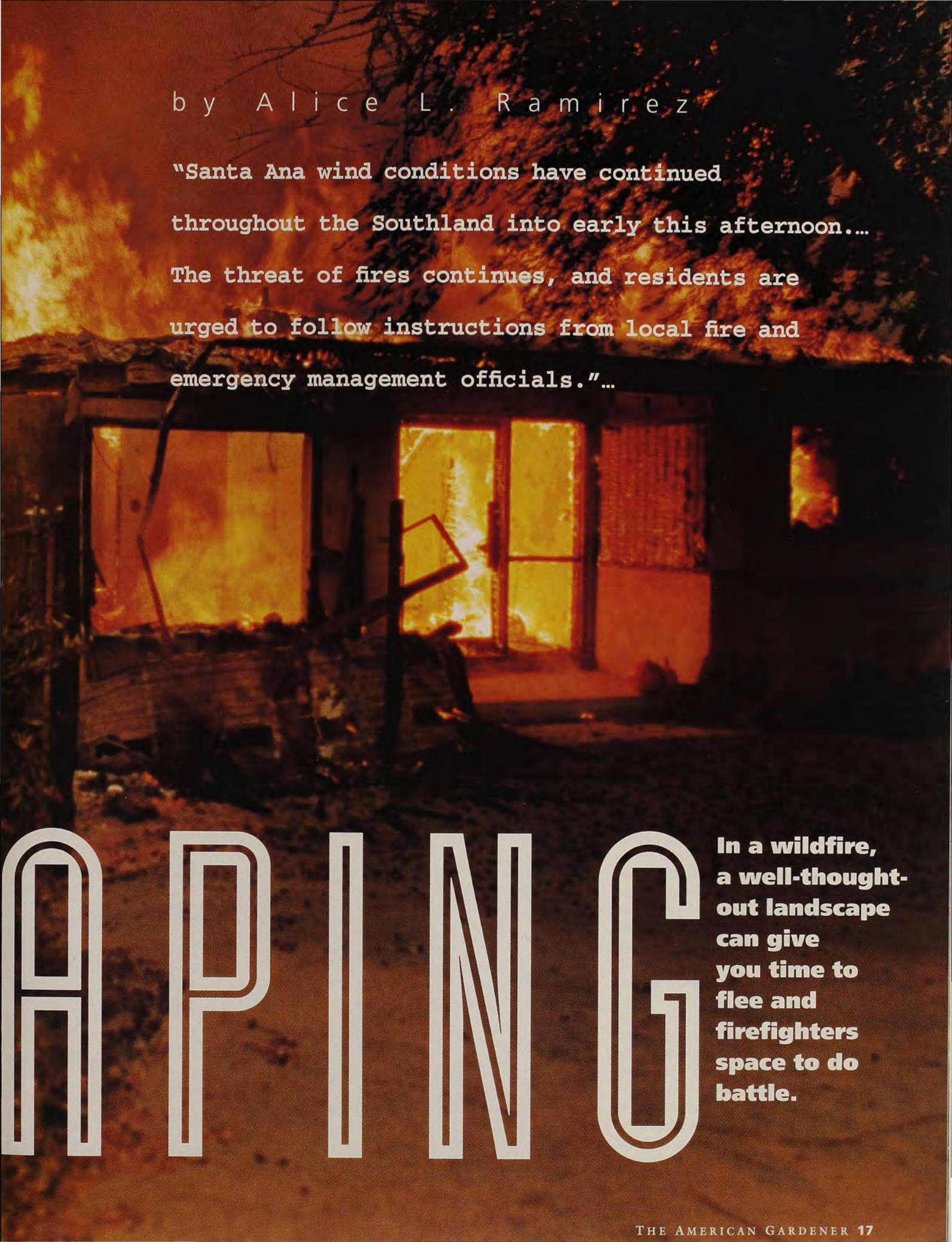
DAVID CAVIGNARO





# FIRESC





by Alice L. Ramirez

"Santa Ana wind conditions have continued throughout the Southland into early this afternoon....

The threat of fires continues, and residents are urged to follow instructions from local fire and emergency management officials."...

# APING

**In a wildfire, a well-thought-out landscape can give you time to flee and firefighters space to do battle.**



On October 27, 1993, Malibu resident Deborah Carpentier didn't really need to hear the radio weather reports to know her home was in peril. Just walking outside, she could feel the hot and oddly disturbing wind that dried out the inside of her nose and parched her skin. Locals dread the Santa Anas. In addition to their other bad qualities, they seem to excite arsonists.

Carpentier had good reason to be nervous. Malibu is nestled among the Santa Monica Mountains, whose canyons are natural chimneys. And 1993 had been an unusually fiery summer. Already, wildfires had claimed more than 30,000 acres in at least six counties and destroyed 140 homes. The worst was yet to come.

Santa Ana winds were still blowing six days later when, a little before 11 o'clock in the morning, an arsonist drove or walked to the top of Old Topanga Canyon Road and touched a flame to the tinder-dry, oily chaparral. Fifteen minutes after discovering the blaze, Los Angeles County Fire Chief P. Michael Freeman offered this grim prediction: "Topanga Canyon is on fire and we expect it to burn to the sea."

It would be the worst fire in Southern California history, with a ferocity that stunned even firefighters. Flames devoured Malibu, Carbon, Los Flores, and Big Rock canyons, pushing south toward the ocean. Palm trees on Malibu beach became giant torches. The U.S. Coast Guard cutter *Conifer* moved to the waters off Topanga Canyon to rescue people driven by fire into the sea, while individual fire engines broke off from the Pacific Coast Highway to save homes on the land side.

They didn't always succeed, and Deborah Carpentier was not one of the lucky ones. She grabbed her 18-month-old son and raced to the ocean while her hillside house went up in flames. "I had him wrapped up in a towel. He was screaming," she told reporters later. Her face streaked with smoke, she stood on the beach and watched her house burn.

### **Vulnerable Landscapes**

California, because of its huge population and Mediterranean weather, is especially vulnerable to wildfires. But they can occur in any natural location where drought has created potential fuel and wind can spread flames rapidly. In Virginia, for example, the Department of Forestry has estimated that more than 365,000 homes could be targets of wildfires. A 1985 Florida wildfire de-



CLOCKWISE FROM TOP LEFT: ROB SIMPSON, MICHAEL S. THOMPSON, ANITA SABARESE, BEN PHILLIPS; PHOTO/MATS





**Wildfires can occur in any natural location where drought has created potential fuel and wind can spread flames rapidly.**



There's no reason for fire-wise landscaping to be bleak. Plants recommended as fire resistant include (clockwise from upper left): gold moss sedum (*Sedum acre*), ice plant (*Drosanthemum floribundum*), green santolina (*Santolina virens*), and Peruvian verbena (*Verbena peruviana*). Here 'St. Paul' Peruvian verbena drapes over a low stone retaining wall, which can act as a firebreak.









CHRISTI CARTER (LEFT), ALICE RAMIREZ (RIGHT)

stroyed 400 homes in that state. Homes in areas surrounded by natural landscapes—a setting especially appealing to many gardeners and sometimes called “the urban-wildland interface”—are under particular threat. Mountainous areas present special problems. Once a fire has stripped a slope of vegetation, erosion is more likely; California’s fierce winter rains and flash flooding make mudslides almost as dangerous as its fires.

The igniting of a particular plant community—prairie, sagebrush, various conifers—creates a conflagration characteristic to each. Ironically, humans have made fires more dangerous by suppressing periodic blazes that would naturally clear out underbrush and dead wood. Laws intended to preserve endangered species also prohibit clearing such potential fire fuel. Wildfires in chaparral, the vegetation typical of Southern California canyons, are among the hardest to control. The high oil content of chaparral plants heightens their volatility, and because they grow close together on often steep, unstable terrain, they create a physical barrier to firefighters.

Yet near large cities, these brush-covered hillsides are prime real estate, heavily developed in seeming defiance of the wild-fire-flood-erosion cycle. Residents have learned the hard way: Paying attention to what they plant, where they plant it, and how they maintain it can make a crucial difference when nature goes out of control. Homes saved during the 1993 Malibu holocaust, according to Inspector George Valenzuela of the Los Angeles Fire Department Brush Clearing Division, were those whose owners had followed brush modification laws, separating the structure from surrounding vegetation and giving firefighters room to maneuver.

About a decade ago, horticulturists and firefighters in Southern California began developing a more elaborate approach to landscaping in fire country. “Firescaping” has some parallels with the low-water gardening approach sometimes known as xeriscaping, since both call for careful selection of plants placed in different zones. In this case, rather than siting plants according to their relative drought tolerance, they are planted nearer to or farther from the house according to their fire resistance. Scott Franklin, formerly a vegetation manager with the California Water Commission, says that when officials began examining drought-resistant plants to recommend

## Homes saved during the 1993 Malibu holocaust were those whose owners had followed brush modification laws, giving firefighters room to maneuver.



The careful owner of the home at left planted fire-resistant shrubs such as *Ceanothus* ‘Joyce Coulter’, foreground, and rock rose (*Cistus xpurpureus*) in front of her house. Trees closer than 40 feet were removed. The one at right is valley oak (*Quercus lobata*), a native whose roots help control erosion. The home above, on the other hand, is surrounded by tall vegetation, including a pine. Conifers can fuel a fire both through their volatile oil and by dropping dry needles on and around a house.



## Special Rules for Slopes

to landscapers and gardeners, they found that many were also fire-resistant. “Soon after, the California Department of Forestry began to talk about firescaping.”

According to Franklin, the zone concept was developed in Los Angeles County by Klaus Radtke and other fire control experts; the Los Angeles County Arboretum had begun developing a list of fire-retardant plants in the 1950s. While any plant will burn in a hot enough fire, some species ignite less readily due to their unusually high moisture or low oil content. In 1987, the City of Santa Barbara established the nation’s first public Firescape Demonstration Garden. In addition to plant selection, these models look at plant spacing and height—low-growing plants deprive a fire of fuel—and urge removal of any dry plant debris or dead branches. Even succulents can lose their fire-retardant qualities in a severe drought, so attention to irrigation is important. And in California, steep slopes must be covered in plants deep-rooted enough to hold the soil.

### The Zone Concept

In the Santa Barbara demonstration garden, the landscape is divided into four zones; experts elsewhere suggest three. Zone 1 encompasses the first five to 10 feet around the outside walls of the house. The goal here is to create a buffer greenbelt of maximum fire resistance by limiting the landscape to very low growing succulents, turf lawns, and rock mulches or walkways. The Santa Barbara model recognizes gardeners’ hunger for colorful flowers and shows how favorites such as roses, hibiscus, and daylilies can be incorporated.

Zone 2 extends another 30 feet beyond Zone 1. In this area the firescaping should keep plantings to a foot-and-a-half tall and widely separated: The space between shrubs should be at least five times their height, and trees should be spaced so their canopies are at least 10 feet apart—more on a slope. Another approach is to group two or three shrubs into “islands” and treat them as a single plant. These woody plants can be interplanted with spreading or mat-like ground covers.

Zone 3 is a transitional area that consists of natural vegetation that has been thinned or sculpted to reduce foliage mass. On a level property, fire officials recommend 100 feet in all directions. If the property is on a slope, the recommended boundaries of the zone are even farther

Light a match. First hold the matchstick horizontally, then carefully angle the matchhead so it’s lower than your fingers. This is what happens when wildfire reaches a slope. Flames are closer to their fuel than when on flat terrain, and they elongate as rising heat and radiation dry out and raise hillside shrubs and weeds to an ignitable temperature. Add wind—likely during any serious firestorm—and everything escalates. “If you are right on top of a steep slope,” says George Valenzuela, an inspector for the Los Angeles Fire Department Brush Clearing Division, “you can have flames 200 or 300 feet high.”

For this reason, fire officials say that the steeper your slope is, the larger the outside zone of your firescape should be, particularly toward the downhill side of your property. For instance, if your slope is greater than 40 percent (100 percent is a vertical drop and 0 percent is flat terrain), they recommend a Zone 3 that extends 200 feet up the slope and on each side, and 400 feet downhill. Not all lots are this large, of course; neighbors are encouraged to cooperate in their firescaping.

Trees should be farther apart as well. On a slope of 20 percent or less, crowns of trees should be 10 feet apart, but on steeper slopes a 20- or even 30-foot gap is recommended. The opposite is true of shorter-statured plants.



A slope at Quail Botanical Gardens in Encinitas, California, is planted with fire-resistant plants. On top, natives that control erosion are left in place.

To control erosion, shrubs chosen for their fire-resistant qualities may need to be planted closer together than is ideal in terms of fire safety.

Homeowners should not be too anxious to yank out and replace established plants, however, even those that are somewhat volatile. It will take new plants a long time to develop soil-anchoring root systems. Avoid clearing out an area greater than you can re-cover with low-fuel plants the same season. Landscape netting can provide temporary stabilization.

Deep-rooted natives should be left in place, thinned out, and pruned well, at least until any replacement vegetation is well anchored. Even if trees burn to the ground, their roots are still good for erosion control for a few years and will often resprout. Californians are encouraged to plant or leave in place for slope stabilization such natives as California live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), California laurel (*Umbellularia californica*), and California sycamore (*Platanus racemosa*). All resprout after fires.

Choose ground covers that spread quickly to control erosion and suppress weeds. Trailing gazania (*Gazania rigens* var. *leucolaena*) works on a gentle slope, while Algerian ivy (*Hedera canariensis*) will hold a steeper incline. Vincas (*Vinca major*, or periwinkle, and *V. minor*, or myrtle) control erosion and are moderately fire resistant but tend to escape their allotted space. —A.R.



from the house, particularly toward the bottom of the slope (see sidebar, page 22).

### Plant Height

Fire danger increases when available fuel, such as tall plants, combines with dry air and wind. For example, in six-foot chaparral, winds of less than 10 miles an hour will whip flames up to 30 feet high. Among two-foot-tall plants, however, winds would have to approach 50 miles per hour to support a comparable fire. Tall ornamental grasses are cited as a particular danger when planted too near a house. We obviously can't control the humidity or wind, but we do have some control over plant height.

Burning trees can produce flames twice as high as their crowns, and conifers and eucalyptus contain volatile oils that, especially when drought-desiccated, can virtually explode. Pines drop needles and cones, while eucalyptus shed oily leaves and peeling bark. Such fuel, on a roof or near a foundation, can allow a relatively low-risk grass fire to become a towering inferno.

Deciduous trees are more fire resistant than evergreens because they have a higher moisture content when they're in leaf, and they provide less fuel for a fire when they're dormant. Almost anything from *Acer* to *Zelkova* is equally "acceptable" in a firescape. Deciduous fruit trees are fine, and citrus are somewhat fire resistant.

More important than your choice of tree are its placement and pruning. Keep conifers out of Zones 1 and 2 and keep deciduous trees well separated. An important concept in firescaping is "ladder fuel," which allows flames to climb up from grasses to tree canopies, or from treetops to the ground. To eliminate ladder fuel on a large tree, firefighters recommend removing all limbs to 15 feet above the ground; on a smaller tree, to perhaps one-third of its height.

### Creativity and Common Sense

At first glance firescaping seems like a bleak approach to gardening, with dire warnings about what to remove and what not to plant, but it needn't be joyless. Clearly, you will want to keep compost and woodpiles well out of Zone 1. But while you don't want to have tree branches hanging over a shake shingle roof or a chimney, Valenzuela says a tree can be left near the house if it's sensibly pruned and brush is cleared from underneath it. Go ahead and plant a shrub within the tree's drip line; just prune it so the tree's lowest branch is at least

three times the shrub's height.

Firescapers advise against using wood mulches for paths. But that still leaves creative exploration of tile or stone walkways. Instead of shrubs, gardeners can attain similar bulk in the landscape with decorative boulders. Brick and flagstone patios and low stone walls are often recommended as firebreaks. And what could be more perfect than a water garden? In a fire-prone area, homeowners have the perfect excuse to put in that koi pond, swimming pool, outdoor Jacuzzi, or hot tub. These delights of the senses, according to Valenzuela, also offer valuable supplemental water for firefighters.

Low-growing succulents are considered the quintessential fire-resistant ground cover, but many are too tender to survive temperatures more than a couple of degrees below freezing. An exception is the hardy ice plant. With protection, the purple-flowering *Delosperma cooperi* tolerates temperatures down to zero, while yellow-blooming *D. nubigenum* has been known to withstand 25 below. Another option is *Sedum acre*, a.k.a. "gold moss sedum," which combines succulent yellow-green leaves, an extremely low-growing habit—two to five inches—and cheerful yellow flowers. In mild climates its rampant spread can be a problem, however. Other hardy ground covers suitable for Zone 1 of a firescape include Mexican evening primrose (*Oenothera speciosa*, to minus-25) and the yellow-flowered subshrub *Santolina rosmarinifolia* (hardy to 10 degrees), to name but two.

To the mild-climate gardener not obsessed with subdued good taste, other ice plants offer superior fire resistance. These succulent trailing ground covers in Aizoaceae or the carpetweed family—*Maleophora*, *Drosanthemum*, and especially *Lampranthus* species—blanket shallow slopes in late winter and spring with blooms of meltdown yellow, radiation rose, riotous red, and passionate purple. (*Carpobrotus* species have become *flora non grata* since their extremely invasive nature became apparent.) Their shallow root systems do not provide erosion control, however. Valenzuela warns that using them as ground cover on a slope greater than 30 percent can pull down a whole hill in hard rain.

Some ground covers that don't qualify for Zone 1 because they tend to build up mats of dry stems—carpet bugle (*Ajuga reptans*) and low-growing culi-

**Burning trees can produce flames twice as high as their crowns, and conifers and eucalyptus contain volatile oils that can virtually explode.**



## Resources

### CALIFORNIA WILDFIRE LANDSCAPING AND THE WILDFIRE SURVIVAL GUIDE.

Both by Maureen Gilmer, these offer ideas for statewide and national audiences. Paperback, 162 pages. Available from the AHS Book Service. AHS member price: \$9.95. Call (800) 777-7931 ext. 36 to order.

**FIREWISE LANDSCAPING.** A set of three videos—overview, landscaping, and maintenance—appropriate for use by gardening groups. Free, but supply limited. Write to Firewise Landscaping Videos, Public Fire Protection Division, National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101.

In the outer zones of a firescape, mild-climate gardeners should consider the taller aloes, such as the candelabra plant, *Aloe arborescens*, opposite.

nary herbs such as creeping thyme and mother-of-thyme, for instance—are permissible in Zone 2.

An alternative to these more traditional ground covers is planting very low-growing or spreading shrubs. Unlike rooting vines, shrubs are easy to keep hydrated by drip irrigation. Saltbush species in general tend to be fire retardant, but the very prostrate growth habit of *Atriplex californica*, native to Southern California, makes it an especially useful choice for fire-prone sites. Brewer's saltbush, *A. lentiformis* subsp. *breweri*, is another relatively low-grower that will spread 10 feet and control erosion. Dwarf coyote brush (*Baccharis pilularis*) is not especially fire resistant, but because it grows only about one foot tall it offers little fuel for oncoming flames. The species' 10-foot spread makes it an excellent ground cover. Silver spreader, *Artemisia caucasica*, although non-native, is another option.

Spring-flowering bulbs are a perfect choice, since they will have gone dormant when fire season is at its height. And there are many low-growing perennials up to the task: woolly yarrow (*Achillea tomentosa*), snow-in-summer (*Cerastium tomentosum*), *Chasmanthe aethiopica*, *Bulbine frutescens* var. *incurva*, blue marguerite (*Felicia amelloides*), lilac verbena (*Verbena liliacina*), Peruvian verbena (*V. peruviana*), and ivy geranium (*Pelargonium peltatum*). Planting the low-spiking annual sky lupine (*Lupinus nanus*) among tufts of the gray-foliaged perennial California poppy (*Eschscholzia californica*) creates a brilliant pattern of blue and orange. (Once their flowering period is past, these should be cut back.)

In Zone 3, drought-tolerant, native species will work—even in the chaparral—if regularly thinned out and pruned. If well spaced, sugarbush (*Rhus ovata*) and some of the California lilacs (*Ceanothus* spp.) make attractive bushes or can be trained into small specimen trees. Sumacs—lemonade berry (*Rhus integrifolia*), laurel sumac (*R. laurina*), and sugarbush (*R. ovata*)—have a reputation for being fire prone, but according to Valenzuela, they are fire resistant if they're irrigated during a drought. Where climate permits, consider the larger aloes, such as *Aloe marlothii* with giant leaves and smashing red and yellow flower stalks, or *A. rupestris*, a stately species that erupts in bright red bottlebrush flowers.

Eastern gardeners can keep their dogwoods, witch hazels, elderberries, viburnums, serviceberries, hollies, and

redbuds. Among non-natives, barberries, forsythias, crape myrtles, and lilacs are considered good choices.

### Keep It Clean

As plants age they can become more woody or develop mats of dead material. This makes pruning and seasonal cleanup of perennials another important part of firescaping. Valenzuela recommends that, at the very least, grasses and flammable natives such as sagebrush or chamise (*Adenostoma fasciculatum*) be cut back to about three inches, and larger natives should be thinned out and kept to five feet tall or less. The trimmings can be ground up and used in Zone 2 or 3 as mulch to control erosion and return nutrients to the soil. This will also keep flammable weeds and grasses from springing up where chaparral has been cleared away. This operation should be carried out in winter or early spring so the mulch has time to decompose before fire season.

Most ground covers can handle a yearly mowing or string trimming. Again, winter is best, since the new growth that will emerge as the growing season begins will have a high moisture content. Dead undergrowth not only can spread fire when a blaze is at its height, but it can hide smoldering embers. Following the '93 California fire, homes were lost long after the firestorm had passed.

Irrigation may also be essential to keep plants well-hydrated. In drought-prone areas of the far West, choose irrigation methods carefully, consulting an expert when a system appropriate to a steep watershed needs to be created. During a drought, concentrate whatever resources you have in Zone 1. Farther out, select plants that can be sacrificed.

Wildfires will occur, whether ignited by arson, lightning, or careless campers. Those who want to live deep in the embrace of nature—surrounded by aromatic pines, fragrant eucalyptus, and pungent chaparral natives—may resist the notion of altering the native landscape. But while wildfire, like tornadoes and earthquakes, can subvert every effort at prevention, careful landscaping—combined with measures to fire-proof the home itself—could give firefighters the edge they need to keep a tragedy from happening to you.

*Free-lance writer Alice L. Ramirez recently experienced a fire in her own Los Angeles back yard.*







# The Bear, the Beans, the Compost Queen

**And other tales from people  
who really make the Big Apple  
bear fruit.**

by Kathleen Fisher. Photographs by Katherine McGlynn.

**At most flower shows, it's the lavish model gardens** by landscape architects that get all the attention. But at the New York Flower Show, the folks to beat seem to be products of GreenThumb, the city's community gardening program.

At last year's show, the American Horticultural Society gave its annual citation—for the exhibit best showing the relationship between horticulture and the environment, as well as inspiring viewers to beautify their homes and communities—to the GreenThumb garden at 9th and C on Manhattan's Lower East Side. And this year, it went to a three-part exhibit, one portion of which was created by GreenThumb's Brooklyn Bear's community gardens. The gardens took their name from a teddy bear found during a cleanup of a vacant lot on Flatbush Avenue in 1986. The gardener propped the bear next to a sign saying, "Please don't litter my garden." The bear has since composted, but its spirit lives on in that and two additional Brooklyn Bear's gardens.

GreenThumb, sponsored by the City of New York Parks and Recreation, began in 1978 with no budget and a single part-time staff person as a response to requests to use city property for gardens. Today, funded by federal Community Development Block Grants, it claims the largest municipally run community gardening program in the United States, leasing more than 1,000 lots comprising some 125 acres to 700 community groups. GreenThumb leases each space for \$1 a year to churches, drug rehabilitation pro-





Dorothy Johnson, Robert C. Howell, and Idonia and Juanita Johnson, *Vernon/CASES Community Garden, Bedford-Stuyvesant*

grams, block associations, day care centers, and others. It helps with design, construction, and horticultural techniques, and with supplies ranging from plants and tools to lumber.

The gardens are rich in found objects—wood Madonnas, painted rocks and car tires, and bricks and architectural details from crumbling neighborhood buildings. But they also sprout more formal art. GreenThumb's Artists in the Gardens program has led to the creation of 17 sculptures and 10 murals in the gardens; its Education in the Gardens program provides materials and curricula through which school groups and local children are brought into the community gardens or helped to start their own.

While community gardens have a long history of fulfilling a need for fresh fruit and vegetables in hard economic times, GreenThumb Director Jane Weissman says these gardeners are motivated less by the need for food than by an adamant refusal to watch











## City Farmers: A Few Tales from the Field

*When people walk by, they compliment the garden. One surprised person said, "It's magic." So we called the garden The Magic Garden. But in reality, the magic is within us.*

—Lydia Roman, The Magic Garden, East Harlem, Manhattan



**Margaret McQuillar and Elizabeth Smoaks, Pleasant Avenue Community Garden, East Harlem**

*When we first started cleaning out our lot, the morning dew wet my hands and legs. I sat down on a rock and, seeing that the dew still covered the weeds around me, I started remembering my childhood in Puerto Rico. I used to follow my mother into her vegetable garden where she grew yautia. It had round leaves which, in the mornings, were covered with dew. To me, it looked like pearls. I stared at it a long time, and then I drank those water drops from the leaves of the yautia plant.*

—Antonia Diaz,  
1001 Anderson Avenue Garden,  
Highbridge, South Bronx

*I have enough from my garden to supply my neighbors and enough to put in my freezer for the winter. I also make my own booze from my grapes. I am a happy man.*

—Otis Butler, Peach Tree Garden,  
Morrisania, Bronx



*Digging in the ground, I found a small box. I thought it had money, but it was full of teeth with gold fillings! Took them to a pawn shop. The guy said, "They're worthless." But he kept them anyway.*

—Angie Aponte, Green Village,  
Bushwick, Brooklyn



**Brisas del Caribe, Lower East Side**

neighborhoods deteriorate. "These new growers see gardens less as community improvement projects and more as refuges from the violence and drugs ravaging their neighborhoods," she says. "The demand for workshops on garden activities for kids rivals that for growing tomatoes and herbs."

Several years ago, a seed packet of string beans was missed by the 1100 Block Association, says gardener Jim Mackey, and they discovered an 11-year-old had taken it. "After two weeks, we saw this bushlike plant. After close examination, we realized it was the string beans. A typical New Yorker! She knew the seeds must go in a hole, and that she did."

The gardens don't touch just this generation of children. They also stir memories of home and childhood for New York residents transplanted from 27 states and the District of Columbia—from Latin America, the Caribbean, Africa, Asia, and Europe.

"My culture and traditions decided for me to create something in the heart of 'El Barrio' to remind me of my homeland—Samaná, Dominican Republic, a place I will never forget," says Julio Barrett of La Cuevita in East Harlem. "I also wanted to bring

a part of my country to Spanish Harlem.... Nothing compares to the feeling of sharing what the earth gives us.... We feel privileged, almost like millionaires, to see the fruits of our labors grow."

Many GreenThumb gardeners are Puerto Rican and have a *casita*, or clubhouse, as a central feature of their gardens. Southerners have planted black-eyed peas, tobacco, peanuts, and cotton, while a gardener from Guyana nurtures corn 18 feet high.

At the 9th and C garden, participants are from South Africa, South America, Australia, England, Germany, Brazil, and Iran, among other places. The garden's founder, Nin Garcia, was a maintenance man. The current president, Tom Versella, is a freelance landscaper. He's found that the job is as much about politics as plants: Some of the other gardeners didn't like the stone walks he and cabinetmaker Xavier Rodriguez created; another battled to keep a tall fence for her beans, which Versella saw as a security risk. It's no secret, says one GreenThumber, that the hardest part of community gardening isn't keeping the hornworms out of the tomatoes, but getting along with fellow growers.

But others note the sense of community—swapping recipes,





Brisas del Caribe, Lower East Side

*I worked a solid month clearing away old tires and rusted-up automobile parts. During that period we didn't have a gate, so when I was finished I used a cable wire to close off the property and to let the community know that this place was no longer a dumping ground. The next day I returned to find the cable wire cut and a load of tires stacked up in the very space I worked so hard to clear. That was, indeed, one of the darkest moments of my life.*

—Abu Talib, Taqwa Garden, Highbridge, South Bronx

*I slap on my headphones, listen to Mozart, and putter. After a while, I take a breather and sit in the gazebo, just watching the flowers grow. One Sunday, there I was with muddy knees and bits of weed in my hair when a very proper lady wearing little white gloves passed by. I must have startled her when she spotted me. Quite loudly, she commented about my sitting around instead of going to church. I didn't say a word. How could I explain that I was already there?*

—Johanna Sherman, The Bayview Gardens, Coney Island, Brooklyn



9th Street Community Garden, Lower East Side



Back row: Loreal Malloy (Garden Eight), Mark Ashman, Michael McCoy. Front row: Kenaisha McCoy, Shaleen Richardson, Kendal Malloy, Alexis Hernandez. Five-Star Gardens, Central Harlem.

*We have had wedding parties, birthday parties, and brunches thrown at the garden that made it look like the spot to give a party. I am always bursting with pride when I am working in the garden and someone who has never been inside steps in for the first time. The look on their faces tells the story.*

—Brian Howard, Creative Little Garden, Lower East Side, Manhattan

playing dominoes, having barbecues. A number of gardens have stages where impromptu performances by children or more organized events are held. The garden at 6th and Avenue B is particularly busy, with free concerts, poetry readings, yoga classes, and compost workshops. “Having a community garden is like having a huge back yard,” says Vernice Akpan of the Brooklyn Bear’s Carlton Avenue Garden. “Instead of talking to your neighbors over the fence, you talk across your vegetable boxes.”

Asked to write about the Brooklyn Bear’s garden for a booklet, *Tales from the Field II*, gardener Jon Crow described:

“Ed, our gentleman New England farmer, who politely prowls the neighborhood trading plant stock with anyone who will play.

“Susie, our compost queen, torn between the urban sprawl and her farm roots in Virginia, gently prodding us into the habit of turning the pile.

“Vernice, one of our free spirits, sharing her African recipes at our gatherings and cultivating plots in all three gardens.

“Gary, suit and tie during the day, mud up to his elbows in the garden.

“Liz, who brings her mother to the garden to tell us the plant names she remembers from her native Romania.

“Yesenia and her folks, native to El Salvador and Cuba, two generations tending their mini-farms, making the garden a family affair.”

Crow says this is just the short list of their participants, who range in age from nine to 79. “You meet the best New Yorkers in a GreenThumb garden.”

*“City Farmers: A Portrait of GreenThumb Gardens and Gardeners” is an exhibit of photographs by Katherine McGlynn that was shown last year at the Museum of the City of New York and this spring at the U.S. National Arboretum. The photographs on these pages are from that exhibit, and the quotes from GreenThumb gardeners are from Tales from the Field II, published in conjunction with the exhibit, and an earlier Tales from the Field booklet. For more information, or to receive free copies of these booklets, contact GreenThumb, City of New York Parks and Recreation, 49 Chambers Street, Room 1020, New York, NY 10007, (212) 788-8059.*



**"In our anxiety for a frost-free display of colour (we) are apt to overlook ... the boon of simple green ...."**

—Louise Beebe Wilder

**Green serves humbly** as the most prominent theme in our landscape—the eternal unifier. Writer Louise Beebe Wilder called it one of the “restful and reparative colours [that] make up the beautiful commonplace of our daily seeing.” It is so pervasive and so serene it can easily go unnoticed.

Yet green flowers can be seductive. The very subtlety of their color lets shape and texture share center stage. Vermont gardener Wayne Winterrowd has written that “green clarifies the fascinating forms of flowers much as a black-and-white photograph clarifies the beauty of a natural scene.” In the garden, the success of green flowers lies as much in the blossoms’ individual forms as in the plants’ artful incorporation into the landscape.

Usually portrayed as novelties, green-flowered plants are actually quite prevalent

these chubby “tulips” have a pallid beauty worthy of indoor display. The tree’s height of 70 feet or more, however, puts its blossoms out of range for all but high-rise dwellers unless a heavy spring storm knocks them down for close inspection.

In the Southeast, a smaller alternative is the Asian tulip tree (*L. chinense*), hardy only to USDA Zone 8 but topping out at 40 to 50 feet. The leaves are more deeply lobed, and the flowers half as large and a deeper green than those of the American counterpart.

#### **Shrubs and Vines**

None of these trees will flower young. More precocious is the holly-leaf sweet-spire (*Itea ilicifolia*), a Chinese shrub noted for its leathery, dark green, spiny-tipped evergreen foliage. While it has been most popular in the Northwest, it has been

# Just Green

by Jack Henning

in nature. Easy to overlook because most of them are so tiny are the ones produced by trees. Such is the fate of the American and European beeches, the ginkgo, the honey locust, the common mulberry, the oaks, and the sweet gum. That otherwise pernicious weed the Norway maple (*Acer platanoides*) redeems itself each April when its innumerable clusters of intense acid lime flowers shimmer against blue spring skies.

Even when these flowers are larger, one often needs to know when and where to look for them. The 60-foot-tall cucumber tree (*Magnolia acuminata*) carries its ghostly pale, yellow-green blooms atop its canopy at bird’s-nest level in late May, about the same time that its leaves emerge. The nine to 12 tepals, arranged in rows of three, emerge from a glaucous-tinged bud to form a slender, three-inch bowl.

The aristocratic tulip tree (*Liriodendron tulipifera*) has similar flowers that are also carried high, beginning in late April or early May before the leaves appear and continuing into June. A shiny yellow-green with a basal band of palest cantaloupe orange,

grown successfully by J. C. Raulston at North Carolina State University Arboretum in Raleigh, so it warrants a try by eastern gardeners who can give it a protected microclimate. It grows quickly to 10 feet and will flower its second season. *Itea* is Greek for “willow,” a reference to its gracefully drooping, foot-long tassels of short-petaled pale green flowers that festoon the branches in midsummer, emitting a honey fragrance.

A nearly infamous green-flowering shrub is ‘Green Rose’ or *Rosa chinensis* ‘Viridiflora’. This stiff, three-foot shrub flowers from May through October, holds up to August heat and humidity, and shows considerable disease resistance in a problem-riddled genus. Yet even fans of the stunted green flowers realize that they are in the minority. “I don’t think many people besides myself,” wrote English gardener Margery Fish, “would say it adds much to the gaiety of the garden.” The flower looks sickly, its petals actually a ruff of pale lime green bracts with reddish brown stains. Yet as a cut flower, a

**The spathe of our native jack-in-the-pulpit, opposite, usually sports purple-brown stripes, but it is sometimes more solid green.**







**The miniature rose  
'Green Ice' has  
whitish pink blooms  
that gradually fade  
to pale green.**

newly opened bud possesses a strange but elegant wonder.

A more attractive option is the miniature rose 'Green Ice', which has whitish pink blooms that gradually fade to pale green. Suitable for containers, 'Green Ice' grows to only about a foot and a half tall and is disease resistant and winter hardy. Dutch breeders have recently released 'Pistache', which appears to be a truer yellow-green.

Finding the yellow-green flowers of the vining Dutchman's pipe (*Aristolochia macrophylla*, formerly *A. durior*, Zone 5-8) requires a bit of effort since they're tucked beneath masses of giant heart-shaped foliage. Train the vigorous green stems to an overhead pergola and you can more easily spot the lurid pipe-shaped blossoms, which have a curious, fetid scent. Appearing in May, they are an inch-and-a-half long and iridescent like an insect. The calyx is shaped like a bent tube, and the "bowl" of the pipe has a three-lipped mouth spotted with brown.

More conspicuous are the chunky bells of the Asian bellflower (*Codonopsis viridiflora*, Zone 6-9). As prone to sprawl as to climb, the loose, open plants can scramble to four feet tall. Thin dark stems bear widely spaced, lance-shaped leaves, slightly fuzzy underneath. The reflexed one-inch flowers are a bright lime green, with dark spots at the base. *C. tubulosa* is similar but with more rounded leaves and larger flowers that are intricately veined inside with purple hieroglyphics. Plant bellflowers under sturdy shrubs where they can scramble from shade into sun.

That "queen of climbers," the clematis, offers two forms vaguely green of flower, both averaging about 10 feet tall. Although the two-inch flowers of *Clematis viticella* 'Alba Luxurians' (Zone 6-10), which nod slightly on slender stalks, are primarily creamy white, the sepals have a distinct silvery green on their recurved tips. The color is most intense on the first flush of bloom in midsummer. The more tender *C. tibetana* (Zone 7-9) has down-facing, bell-shaped flowers that can range from pale yellow to a subdued green-beige, speckled brown inside. The flowers are not what most people would call beautiful, but handsomely cut glaucous foliage adds considerably to the plant's appeal.

### **Plenty of Perennials**

Herbaceous perennials provide the green flower fancier with many an option. Per-

haps the best-loved is the common lady's-mantle (*Alchemilla mollis*, Zone 3-8), a clump-former native to the region around the Black Sea in southeastern Europe. Its rounded, green basal leaves are scalloped, pleated, and covered with soft silky hairs that repel water so that it beads up into silvery drops. The plant's generic name derives from the Arabic word *alkemelych*—a reference to the alchemists who collected the water droplets in trying to make gold. Growing up to 30 inches tall, in early summer the plants burst into a froth of tiny, acid green flowers—never mind that they lack true petals. Able to produce viable seed without pollination, lady's-mantles self-sow with abandon.

The European hellebores offer a veritable cornucopia of green-flowered plants. In this case, the true flowers are reduced to a short ruffle of nectaries, but the showy sepals, regardless of their original flower color, take on greenish tints when they mature and participate in photosynthesis during seed production.

Found throughout much of Europe, slow-growing *Helleborus viridis* is the most widespread of the hellebores, but the least ornamental, with flowers as dark green as the foliage. Almost as far-ranging is the stinking hellebore (*H. foetidus*), so named for the aroma of the crushed leaf. Hardy in Zones 4 to 8, the stinking hellebore is evergreen, its near-black, finger-thin leaves eventually forming a wheel more than a yard across and two feet tall. In a mild year, the flower stalks will form as early as December, elongating as weather permits and flowering shortly after New Year's in warmer climates. The flowers bow gracefully from the erect stem with bracts and petals all one pale icy hue, their tips barely blushed red. Among the many cultivars is the popular 'Wester Flisk', known for red tints in its stems and leaf petioles.

Other green-flowered hellebores include the sweetly scented evergreen *H. odoratus* and *H. cyclophyllus*, which differs from the former primarily in being deciduous. The more tender *H. argutifolius* needs special siting to survive winters even in Zone 7. Its massive evergreen rosettes of stiff, spiny leaflets, grayish on the underside and veined in ivory, make it almost shrub-like and well worth some extra effort.

Sharing the hellebores' poisonous nature are the unrelated false hellebores. The genus name, *Veratrum*, means "truly black" and refers to the black roots of the plants, found in seasonally moist meadows

**Clockwise from upper left:  
The flowers of the tulip tree,  
which are usually too high  
for us to fully admire;  
statuesque angelica,  
which can reach seven feet;  
the shy Dutchman's pipe;  
and lady's-mantle gracing  
a brick walkway.**











in North America, Europe, and Asia. Indian poke (*V. viride*, Zone 4-8) is native to moist soils in eastern North America, where in spring its thick, cylindrical rhizomes begin pushing up sheaths of foliage. Clasped alternately around the six-foot tubular stalk, these leaves will grow a foot long, palmlike and pleated like an accordion. Terminal panicles explode in June with a fireworks of small, mint green stars. English plantsman Jamie Compton refers to the intensely sculptural Indian poke as "both beautiful and vaguely sinister."

Its western counterpart, *V. californicum* (Zone 4-10), is a bit shorter and flowers later. Native Americans are said to have boiled its root for use as a contraceptive. False hellebores are members of the lily family, and this one is sometimes called corn lily and sometimes skunk cabbage, although it couldn't be more different from our swamp-dwelling *Symplocarpus foetidus*.

Another giant among the herbaceous green-flowered plants is *Angelica archangelica*, a biennial or short-lived perennial. Its massive, serrated, three-part leaves are held on thick hollow stems, fluted and flushed with purple. In early summer these are crowned with a candelabrum of stalks up to seven feet tall with tiny bright green flowers in clusters the size and shape of tennis balls. The plant was associated with Saint Michael the Archangel and said to be a safeguard against evil. Today herbalists use it to induce sweating or as a digestive aid. All of its parts are licorice flavored; the stems are candied and the seeds used to flavor liqueurs, although it is considered unsafe to ingest in large quantities.

### Some Choices Among Bulbs

Bulbs are rich in green-flowered genera, with the greatest variety among the fritillaries. The two-foot stems of the Middle East native *Fritillaria acmopetala* (Zone 7-9) bear narrow gray-green leaves and, in mid-April, one or two one-and-a-half-inch pendant bells from their tops. These are olive green with glistening reddish brown on three of six petal segments. The flower's mouth is pinched, with recurved tips. Native to scrubland from Turkey to the Balkans, the shorter-growing *F. pontica* (Zone 6-9) blooms in May, producing one to three glaucous yellow-green "lanterns" with faint brown rims on their petals.

The South African galtonias, related to hyacinths and similar in both their flower spikes and light, sweet fragrance, offer two choices of green-flowered summer bulbs.

The greener of the two, *Galtonia viridiflora*, forms a clump of glaucous, blunt-tipped basal leaves two feet long and four inches wide. Sturdy three-foot spikes are studded with pendulous, fleshy green-white flowers whose bleached margins flare at the bottom like tiny skirts. *G. princeps* is smaller in every respect, the nodding pale mint blossoms compressed to a dainty tube at the base. Both species are tender and require container culture or winter storage north of Zone 8.

Another tender South African genus is *Eucomis*, commonly called the pineapple lily for the tuft of green leafy bracts that caps the flower stalk. The genus name comes from the Greek *eukomos*, meaning "beautiful headed." The large fleshy bulbs form a basal rosette of shiny, strap-shaped leaves, almost succulent in texture and rippled along the edges. The leaves are usually bright apple green, with purple spots on the undersides in some species.

The best-known pineapple lily is the chunky-leaved *Eucomis bicolor*. Mature specimens can send up 30-inch flower spikes densely packed along the upper four inches with starry one-inch flowers. The lower blooms sag in a compressed configuration that, combined with their leafy headdress, really does suggest a pineapple. The long-lasting early summer flowers are pale greenish white with a deep purple edge. Irish gardener Helen Dillon notes "a slight whiff of long-boiled cabbage" about them.

The flower stalk of the slender-leaved *E. autumnalis* is only about half as tall but is just as densely packed with blooms. These face outward and cover nearly the whole stem. Despite the plant's name, these tend to appear in August here in the United States, opening off white before quickly turning olive green.

The larger-leaved *E. comosa* holds its flowers loosely on a two-foot spike, the half-inch blooms light green with flashy red-violet centers.

The most exotic-looking green-flowered plants are in the fascinating genus *Arisaema*, although the best-known isn't "exotic" at all, but our own wide-ranging eastern native jack-in-the-pulpit, *A. triphyllum* (Zone 4-9). The inflorescence—not flowerlike at all, but a clublike spadix sheathed in a hooded spathe—produces heat that disperses chemical attractants for pollinators.

Many of the species in this genus change sex as part of their survival strate-

**A gardener could make a specialty of collecting green flowers or spend hours seeking the ultimate shade to complement other colors.**

**Clockwise from upper left: The stinking hellebore, which can begin blooming shortly after New Year's; the false hellebore *Veratrum californicum*, sometimes known as corn lily; bells-of-Ireland, whose pink flowers, each nestled in a green calyx, give it another common name, lady-in-the-bath; *Eucomis comosa*, which stands out among pineapple lilies for its large leaves and red-centered flowers.**



## Sources

**COLLECTOR'S NURSERY**, 16804 N.E. 102nd Avenue, Battle Ground, WA 98604, (360) 574-3832. Catalog \$2. *Clematis tibetana*, *Galtonia princeps*.

**THE COMPLEAT GARDEN CLEMATIS NURSERY**, 217 Argilla Road, Ipswich, MA 01938-2617, (508) 356-3197. Catalog \$1.50 (deductible). *Clematis viticella* 'Alba Luxurians'.

**DAFFODIL MART**, 7463 Heath Trail Gloucester, VA 23061, (800) 255-2852. Catalog free. *Eucomis* species, *Fritillaria acmopetala*, *F. pontica*, *Galtonia viridiflora*.

**HERONSWOOD NURSERY**, 7530 N.E. 288th Street, Kingston, WA 98346-9502, (360) 297-4172. Catalog \$4. *Alchemilla mollis*, *Arisaema ringens* forma *praecox*, *Codonopsis tubulosa*, *C. viridiflora*, hellebores.

**J.L. HUDSON, SEEDSMAN**, P.O. Box 1058, Redwood City, CA 94064. Catalog \$1. *Amaranthus caudatus*

'Viridis', *Angelica archangelica*, *Helleborus viridis*, *Moluccella laevis*, *Nicotiana langsdorfii*, *Zinnia elegans* 'Envy'.

**J.W. JUNG SEED COMPANY**, 335 South High

Indian poke

Street, Randolph, WI 53957. Catalog free. *Zinnia* 'Green Envy'.

**LOUISIANA NURSERY**, Route 7, Box 43, Opelousas, LA 70570, (318) 948-3696. Call for individual catalog prices. *Itea ilicifolia*, *Liriodendron chinense*, *Magnolia acuminata*, *Rosa* 'Green Rose'.

**NOR'EAST MINIATURE ROSES**, P.O. Box 307, Rowley, MA 01969, (508) 948-7964. Catalog free. *Rosa* 'Green Ice'.

**ROSLYN NURSERY**, 211 Burrs Lane, Dix Hill, NY 11746, (516) 643-9347. Catalog \$3. *Arisaema* species, *Aristolochia macrophylla*, hellebores.

**THEODORE PAYNE FOUNDATION**, 10459 Tuxford Street, LaTuna Canyon, CA 91352, (818) 768-1802. \$2 each for seed or plant catalog. *Veratrum californicum*.



gy. The jack-in-the-pulpit's first flower will be a male, smaller and thus requiring less energy to produce. If growing conditions are optimal that season, the next year's flower will be a female. When environmental conditions are less than ideal, the plants can revert back to male flowers or remain dormant. The plant can still reproduce by means of offsets from the rhizomatous tuber.

Usually the jack-in-the-pulpit spathe is zebra patterned with purple-brown stripes, although some variants throughout its eastern North American range are more wholly green. The plants can grow to two feet with spathes from four to seven inches and two three-part leaves.

The taller green dragon (*A. draconitium*, Zone 5-9) doesn't occur as far north into Canada as jack-in-the-pulpit and has noticeably different foliage, with one large umbrella leaf divided into 15 slender segments. From its shiny three-inch light green spathe trails a dramatic slender thread up to six inches long resembling a hissing serpent's tongue and giving rise to its common name. The appendage probably serves as a landing strip for pollinators.

There are also green-flowered Asian species—such as the three-foot *A. consanguineum* (Zone 7-9) and the 18-inch *A. ringens* forma *praecox* (Zone 7-9)—that can make tropical-looking additions to a woodland garden. Unfortunately, while most herbivores find them unpalatable, slugs are less choosy.

### Instant Gratification

Gardeners wanting an immediate display of green flowers will find gratification among the annuals. Thirty-inch-tall *Zinnia elegans* 'Envy', developed in the early 1970s, is popular for its double skirt of frosted yellow-green ray petals, although some plants produce fuller-domed blooms than others. 'Envy' is the only zinnia that seems tolerant of light shade.

Among the 70 species of *Nicotiana*—three-quarters of them from the Americas—are a number of green-flowered species, the most comely of which is *N. langsdorfii*, a native of Chile and Brazil. Although it can grow up to five feet tall, its open, airy branching makes it suitable for mid-border, where it can serve as a scrim to allow views of plants behind it. Swaying on thin stems are its beautifully formed one-inch flowers—tubular bells swelling just above their pinched collars. An English catalog, Chiltern Seeds, calls

them "upside-down goblets." From their mouths protrude purplish anthers dusted with powder blue pollen.

'Lime Green' is a popular 30-inch-tall hybrid between two South American species, the perennial *N. alata* and the greenish *N. forgetiana*. The first species is admired for its sweetly scented flowers that open at night; those of the latter are smaller and stay open during the day. The hybrids are a compromise, with the scent surviving only vaguely and the yellow-green chunky blooms more or less staying open during the day. 'Nikki Green' is a more compact selection from the same cross.

Love-lies-bleeding, a favorite annual among the Victorians, has a striking green-flowered form, *Amaranthus caudatus* 'Viridis'. The plush trailing ropes of flowers stand out so dramatically in the garden that they're best used in small numbers or as a single accent. Starting out as small, lime green spikes at the tips of the plants, the chains elongate to nearly three feet and sway languidly in a breeze. The actual flowers are insignificant but are subtended by showier bracts that produce the effect of chenille. The tassels mature to a straw green and are long lasting, as befits a genus name derived from *amarantos*, meaning "unfading" in Greek.

Similarly, the true flower of *Moluccella laevis* is a small, pale pinkish affair nestled deep within a showier cup-shaped calyx, giving rise to the name "lady-in-the-bath." Known better as bells-of-Ireland, this species from Asia Minor is connected to the Emerald Isle only by its color. The three-quarter-inch-wide calyxes, which are held in whorls around the stem, have barely discernible spiny tips covered in a network of fine white veins that on close inspection seem fleshy and reptilian. The flower spikes account for more than a third of the plant's three-foot height.

A gardener could make a specialty of collecting green flowers or spend hours seeking the ultimate shade to complement other colors. In most cases, the reticent green flowers need encouragement to help them stand apart from the whole. If we surrender to their holistic calm, green flowers in the garden can become both frame and filler, the absolver and the absolute—the purity of an entire landscape contained in a single bloom.

*Jack Henning works for a landscape design company in New York City.*

ROB SIMPSON



# Desperately Seeking Cerulean

A look at the complex biochemistry of plant color shows why a blue rose is so elusive.



by Robert Geneve

**A gardening article I recently saw** was headlined “A Passion for Purple.” Maybe some people have a passion for purple flowers, but not me. They’re okay, and so are the tones of pastels. But for passion, give me strong primary colors like red or blue—true blue. As far as I’m concerned, purple is the color that sneaks into flowers and makes pinks dirty or blues washed out. Unfortunately, blue is not a color found commonly in nature, although plant breeders are trying hard to change that.

In our humanocentric world view, it is easy to think that the beautiful colors of flowers are there for our enjoyment. Yet the diversity of flower colors is related principally to two important survival tactics—as a way of attracting pollinators and a means of defense. To understand the range of color in flowers it is necessary to look beyond the poetry of petals and into their biochemistry.

All colors seen in plants are derived from chemical pigments that occur in different parts of plant cells. Among those found in vacuoles—the sap-filled interiors of cells—are anthocyanins,

which play a major role in the development of blue flowers. In tiny organlike structures called plastids that surround the vacuoles are found plastid pigments, including those active in photosynthesis, such as chlorophyll and carotenoids.

The pigments that appear red, pink, purple, and blue in flowers are usually anthocyanins. The term “anthocyanin” is derived from the Greek terms for flower (*anthos*) and dark blue (*kyanos*). Other major contributing pigments to flower color include carotenoids (yellow, orange, red, and brown) and co-pigments (near-white to pale yellow).

Anthocyanins are formed when a sugar (usually glucose) is added to a group of compounds called anthocyanidins. What makes anthocyanidins interesting is that they are named for the plants in which they were first discovered, so their names are familiar to gardeners. The most common compound,

Most irises described as blue miss the mark, but this Pacific Coast hybrid ‘Abel II’ seems as close as they come.





CLOCKWISE FROM UPPER LEFT: ROBERT GENEVE, ALAN L. DETRICK; ALAN AND LINDA DETRICK, JOSEPH G. STRAUCH JR., VIRGINIA TWINAM-SMITH; PHOTONATS (RIGHT)



found in bachelor button (*Centaurea cyanus*) is cyanidin, which is crimson red. Other common anthocyanidins include scarlet pelargonidin, derived from pelargonium; rose red peonidin, first obtained from the peony; purple petunidin, from petunia; and blue-violet delphinidin, from larkspur. Anthocyanidins are unstable and are quickly converted to anthocyanins, of which there are hundreds.

Combinations of anthocyanins in petals provide an almost endless array of red-through-blue color tones. The accompaniment of co-pigments further extends the range of colors available. Many other factors influence the intensity of flower color, however, including environ-

mental stress, plant nutrition, and even insect attack. Red may become richer when plants are grown in climates with cool summer night temperatures, compared to the same cultivar grown where nights remain warm. This is also true of some blue flowers, such as delphiniums.

Many flowers change color as they age or develop. Researchers believe that in some cases this phenomenon may be a signal to prospective pollinators that the flower is already fertilized and no further nectar is available. In larkspur, an increase in the vacuole's pH as the flower matures triggers a color change from red-purple to purplish blue.

A change in flower color from pink to

blue is also characteristic of certain members of the borage family (Boraginaceae). The flowers of borage (*Borago officinalis*), Bethlehem sage (*Pulmonaria saccharata*), Virginia bluebells (*Mertensia virginica*), and forget-me-nots (*Myosotis sylvatica*) are often pink at bud stage, but the individual flowers turn vivid blue as they age. Flowers at different levels of maturity create an intriguing mixture of pink and blue on the same inflorescence.

Another genus that commonly has flowers in a range of shades from pink to blue is *Hydrangea*. The change is most evident in cultivars of *Hydrangea macrophylla* and its subspecies, where from year to year flowers can be anywhere from pale





#### Are they true blue?

Opposite, top row: delphinium, which may become more richly colored where summer nights remain cool;

'Donart Blue' sea holly.

Bottom row: great bellflower (*Campanula latifolia*); balloon flower.

Left: *Hydrangea macrophylla*.

pink to lilac to azure blue. *Hydrangea* growers observed and recorded this in the late 18th century, although at the time the phenomenon was not fully understood. It is now generally accepted that the major factors associated with deeper shades of blue in hydrangeas are slightly acid soil (pH between 6 and 7) and the presence of aluminum in the form of a soluble salt that can be taken up and stored in the vacuoles. Newer cultivars usually don't show this type of color change, however, because modern hybridizers are breeding for color stability.

In some plants, natural genetic diversity gives breeders great leeway in tinkering to produce novel colors. This is nicely

illustrated by the range of colors seen in petunias and impatiens. For plants lacking such diversity, scientists are probing the secrets of the biosynthetic pathway—a series of enzymatic reactions in which more complex molecules are built from simpler ones—that controls flower colors. Once these processes are better understood, it will be possible to use biotechnology to create plants that bloom in colors not currently available in that genus—such as the apocryphal blue rose. Biotechnology could also allow us to intensify colors that already exist in popular plants, such as roses and chrysanthemums, and to produce unique color patterns, such as pinwheels in petunias.

Genetic engineers have already succeeded in modifying flower color in petunias, gerberas, cosmos, and geraniums. One of the best examples of this was accomplished by Peter Meyer of the Max Planck Institute in Cologne, Germany, who was able to transfer the gene for pelargonidin from corn into petunias to create pumpkin orange flowers. Other major horticultural crops targeted for modification of flower color are roses, chrysanthemums, and carnations.

So far, the greatest successes in manipulating flower color have been achieved by altering the early part of the biosynthetic pathway to manipulate anthocyanin production. There are numerous enzymes act-



## True Blue Hues

What flowers can be considered true blue? Like beauty, blueness is to a certain extent in the eye of the beholder. Those of us who love blue flowers feel our hearts swell at the sight of a field of grape hyacinths or violets in spring, but their very names confess to a less-than-blue nature. Irises, for all their intensity of color, usually skirt the edges of azure. And while a trellis groaning with clematis is enough to bring the most steely-hearted to their knees, most hybrids lean to either lavender or purple; some writers call 'Perle d'Azur' the truest blue or sky blue, but this is a stretch.

Then there are the flowers mentioned by Robert Geneve that turn from pink to blue either as they mature, such as Virginia bluebells and *Pulmonaria*, or depending on environmental conditions, such as hydrangeas. Many of the inarguably blue flowers can be hard to grow: Himalayan poppies (*Meconopsis betonicifolia*) and delphiniums seem to be happy only in our Northwest, for instance, and gentians demand the exacting conditions of a rock garden. Others, such as chicory (*Cichorium intybus*) and bachelor's-buttons (*Centaurea cyanus*), are considered too "weedy" for the well-mannered bed.



*Agapanthus africanus*

Here is a list of plants whose flowers author Robert Geneve and members of the American Horticultural Society staff consider the truest blue. We are happy to entertain differing opinions.

### ANNUALS

*Borago officinalis* (borage)  
*Browallia speciosa* (browallia)  
*Evolvulus glomeratus*  
*Ipomoea tricolor* 'Heavenly Blue' (morning glory)  
*Lobelia erinus* 'Crystal Palace' (edging lobelia)  
*Lupinus texensis* (Texas bluebonnet)  
*Myosotis sylvatica* (forget-me-not)  
*Salvia farinacea* (mealy-cup sage)  
*Salvia patens* (gentian sage)

### PERENNIALS

*Aconitum carmichaelii* (USDA Zone 2)  
*Aconitum napellus* (Zone 2)  
*Anchusa azurea* (Italian bugloss, Zone 3)  
*Baptisia australis* (blue false indigo, Zone 3)  
*Brunnera macrophylla* (Siberian bugloss, Zone 3)  
*Campanula* spp. (bellflowers, most to Zone 3)  
*Ceratostigma plumbaginoides* (plumbago, Zone 5)  
*Corydalis flexuosa* 'Blue Panda' (Zone 5)  
*Cynoglossum nervosum* (hound's-tongue, Zone 4)  
*Linum perenne* (blue flax, Zone 5)  
*Lobelia siphilitica* (great blue lobelia, Zone 4)  
*Lupinus polyphyllus* (lupine, Zone 4)  
*Platycodon grandiflorus* (balloon flower, Zone 3)  
*Polemonium caeruleum* (Jacob's-ladder, Zone 3)  
*Scabiosa* 'Butterfly Blue' (pincushion flower, Zone 3)  
*Stokesia laevis* (Stokes' aster, Zone 5)  
*Tradescantia virginiana* 'Isis', 'Zwanenburg Blue' (spiderwort, Zone 5)  
*Veronica longifolia* 'Foerster's Blue' (speedwell, Zone 4)

### BULBS

*Agapanthus* spp.  
*Camassia scilloides* (eastern camas)  
*Chionodoxa grandiflora* (glory-of-the-snow)  
*Scilla siberica* (squill)

ing in this pathway—which kinds, and their activity, determine which anthocyanin is made. Two enzymes in particular—chalcone synthase (CHS) and dihydroflavanol reductase (DFR)—have received the greatest attention.

CHS catalyzes an initial reaction that ultimately leads to anthocyanin pigment formation. The immediate result is the production of yellow pigments such as chalcones, aurones, and flavones. These are not as important as the carotenoid pigments for creating the yellow colors found in flowers, but they do act in tandem with anthocyanins to increase depth or intensity of color. DFR activity—which occurs at the end of the biosynthetic pathway—is

useful because it converts colorless pigments into colored ones.

The techniques used to bioengineer flower color are called ribonucleic acid (RNA) antisense suppression and sense co-suppression. Both techniques involve inserting one or more genes into a plant to reduce the activity of the CHS or DFR enzyme or both. By suppressing CHS enzyme activity in the normally pink-flowered chrysanthemum 'Moneymaker', for example, bioengineers created a nearly white flower.

Creating blue flowers in species that do not normally produce blue pigments will be more difficult. Rather than "merely" suppressing enzyme activity, it will require

inserting a gene not normally present in the plants being modified.

Many species without blue flowers seem unable to make the anthocyanidins that produce blue. The gene responsible for producing the key enzymes in anthocyanidins such as delphinidin, cyanidin, and malvidin has been isolated, and we would expect that if we insert this gene into a non-blue species, the plant would eventually accumulate these pigments at levels similar to normally blue-flowered plants. But scientists have learned that other factors are even more important to the production of blue flowers.

There are plants—tulips, impatiens, and geraniums, for example—that natu-



ELVIN MCDONALD (LEFT), ALBERT SQUILLACE; PHOTO/NATS (RIGHT)



rally make the key anthocyanidins, yet are unable to produce blue flowers. This shows that a lack of these pigments is not what keeps some plants from producing azure blooms. Blue coloration is a complex interaction between the proper anthocyanins, the pH of cell vacuoles, co-pigmentation, chemical modifications of the anthocyanin, and even the presence of certain metals. Of these factors, it appears pH of the vacuole is the most important. Red pansies have a vacuole pH of 5 or under; using classic methods breeders were eventually able to develop blue pansies by increasing vacuole pH to just over 6. In geraniums, however, the pH of the vacuole is extremely acidic, around 2. Hence

the production of a blue geranium is unlikely without developing some way to radically alter the acidity of the cell vacuole.

So don't expect biotechnology to help you paint your garden solid sapphire anytime soon. Genetic transformation, a key step needed to insert new genes into plants, has been researched only in a few of the more commercially important ornamental crops. For now, enjoy the broad palette of colors that nature and traditional breeding have brought us—including the delightful few that are true blue.

*Robert Geneve is associate professor of horticulture at the University of Kentucky in Lexington.*

**How soon will we have a blue rose? One catalog calls the hybrid tea 'Blue Nile', above, "rich solid lilac blue... the best of the blue roses." But reference books show petals that are decidedly pink.**



# Tradescantias

## Unbound

**These humble house plants take on new dimensions in the summer border.**

by Richard R. Iversen

**Plants with purple or burgundy foliage** do double duty for gardeners who delight in orchestrating color schemes. First they pull together the analogous tints and shades of cool-colored flowers—sky blue, lavender, rose, pink, and purple. Then they turn around and surprise us by the way their dark foliage contrasts with yellow, gold, orange, and red—making those hot colors even hotter.

Perfect examples of this phenomenon are the common wandering Jews and their relatives within the spiderwort family, Commelinaceae. When it comes to usefulness, they top my list. Although these mainly tropical and subtropical herbaceous plants are most familiar in the role of indestructible house plants, I ban them from the plastic hanging baskets in which they are usually seen and use them instead in more substantial and decorative containers or in the summer border. The royal purple leaves of these easy-to-grow plants—some marked in silver or gold—

associate magnificently with annuals as well as other plants that vacation outdoors in summer.

Before we embark on a tour of the spiderworts, a word of caution is in order. The nomenclature of this group has been much revised over the years and you are likely to encounter a confusing trail of synonyms. Some taxonomists now believe plants formerly in the genera *Setcreasea*, *Rhoeo*, *Campelia*, and *Zebrina* should be subsumed into the genus *Tradescantia*.

### **Heroic 'Purple Heart'**

*Tradescantia pallida* 'Purple Heart', for instance, was formerly known as *Setcreasea pallida* 'Purple Heart'. An even older synonym is *S. purpurea*. This plant has the richest purple foliage and stems of any plant I know—not burgundy but regal violet purple similar to old-fashioned German iris in May. And its coloration doesn't wither away after a week, but radiates from spring

until the first frost halts its growth. Three-inch leaves, succulent and fleshy with a coat of long fine hairs, clasp the creeping stems.

'Purple Heart' is common throughout Florida and the Caribbean, where it sprawls to form mats and ground covers. Plants bask in full, hot sun and survive long periods of drought. Three-petaled, lilac-pink flowers, about the size of a dime and the shape of a triangle, open in the morning and close after noon.

Here in New York City I grow 'Purple

ELEMENTAL IMAGES







Heart' outdoors as a summer bedding plant in window boxes and decorative poolside containers, or in the ground as an "annual." In the foreground of a window box the plants will reward you with lush trailing growth. Interplant them among lavender petunias or pink ivy geraniums for colorful harmony. To create a Victorian scheme in a classic cast-iron urn, place a single plant of the upright *Dracaena marginata* "Tricolor" in the center and ring it with green-leaved, red- or

pink-flowered wax begonias alternating with cascades of 'Purple Heart'.

Container plantings can be spectacular with only a few flowers—or none at all. Try combining 'Purple Heart' with the bold purple-foliaged Persian shield, *Strobilanthes dyeranus*—variegated in iridescent lilac and blue—and elfin herb, *Cuphea hyssopifolia*. The last is a densely branched dwarf shrub, about a foot tall, sometimes called false heather. Its species name refers to the resemblance of its small

**'Purple Heart' tradescantia, above, is spectacular in boxes or beds with other plants that either complement or contrast with its bold color.**



leaves and lavender purple flowers to those of the herb hyssop. Native to Mexico and Central America, elfin herb is a common garden-center greenhouse plant, but northern gardeners may have to work harder to find *Strobilanthes dyeranus*, a soft-stemmed evergreen shrub native to Burma. Once you do, however, it is easy to propagate. This trio of plants is tolerant of lightly dappled shade.

I bed cuttings of 'Purple Heart' outdoors in May—at tomato time—and weave them through lavender-flowered impatiens in light shade or interplant them with bright red *Salvia splendens* in full sun. I combine them with purple-flowered heliotrope or orange-flowered marigolds with equal success. Perhaps my favorite use is to ribbon them among beds of chartreuse coleus. Using your imagination you can create countless vignettes.

### Colorful Ground Cover

Like 'Purple Heart', the true wandering Jew (*Tradescantia zebrina*, formerly *Zebrina pendula*) is a short herbaceous creeper. In its native Mexico and in other tropical environments, its succulent stems mat together to hide the soil. In the bedding schemes of 19th-century English colonists, it became the Caribbean counterpart to temperate ground covers such as Japanese spurge (*Pachysandra terminalis*) or periwinkle (*Vinca minor*).

The flat leaves, about two inches long by one inch wide, are striped with two silver bands. Upper leaf surfaces shimmer like steel, the undersides like a concord grape. The flowers are rose-pink. A cultivar, 'Quadricolor', has metallic green leaves striped with green, red, pink, and white.

At a client's Long Island, New York, garden I planted *Tradescantia zebrina* in bronze-toned pots to drape beneath lollipop topiaries of the lavender-flowering Philippine violet, *Barleria cristata*, shipped to a local nursery from Florida. Philippine violet is a low, densely branching shrub that is tough, can be propagated from cuttings, and is easy to grow in full sun or possibly dappled shade. The wandering Jew survives shade well, but, like all bronze- or purple-foilage plants, some dappled sunshine will stimulate the purple-producing pigment and brighten the leaf color.

*Tradescantia zebrina* can be used in the same manner as *T. pallida* 'Purple Heart'. In mid-May when the soil becomes warm, space plants six to eight inches apart in containers or beds after enriching the soil with



### Growing Tradescantias

If you have your *Tradescantia* growing outdoors in a container, you may find it possible to overwinter it in the same pot brought indoors to a sunny windowsill, taking new cuttings in early April to plant out six weeks later. If you have woven *T. zebrina* or *T. pallida* 'Purple Heart' throughout a bed, you will want to take cuttings in September.

Although these plants will root easily in water, the roots will be weaker than those on plants started in a growing medium. Stick three- to four-inch stem cuttings in moist sand, perlite, or a mix of one-half sphagnum peat moss, one-quarter vermiculite, and one-quarter perlite. Greenhouse growers are often advised to grow *Tradescantias* in low-light conditions, but reducing light too much can slow growth, elongate stems, and reduce leaf size. Remember, these plants hail from sunny Mexico and thrive in Caribbean sunshine. It is important to monitor springtime light intensities, however, so the tender new foliage doesn't burn. For maximum growth indoors, keep night temperatures between 65 and 75 degrees and water regularly with a dilute fertilizer. —R.I.







The 'Pretoria' canna, opposite top, has golden stripes that will echo those of a variegated oyster plant, *Tradescantia spathacea* 'Vittata'. Common oyster plant or Moses-in-a-boat, center, combined here with velvet plant (*Gynura aurantiaca*), has more upright leaves than other species in this recently expanded genus. Among the many plants the author combines with 'Purple Heart' are false heather or elfin herb, bottom, and Persian shield, left.



## Sources

**DAFFODIL MART**, 7463 Heath Trail, Gloucester, VA 23061, (800) 255-2852. Catalog free. *Caladium* 'Candidum'.

**LOGEE'S GREENHOUSES**, 141 North Street, Danielson, CT 06239, (860) 774-8038. Catalog \$3. *Abutilon pictum* 'Thompsonii', *Cuphea hyssopifolia*, *Plumbago auriculata*, *Sanchezia speciosa*, *Strobilanthes dyeranus*.

**MERRY GARDENS**, P.O. Box 595, Camden, ME 04843, (207) 236-9064. Catalog \$2. *Tradescantia spathacea* (also listed as *Rhoeo spathacea*), *T. zebrina* 'Quadricolor'.

**PARK SEED CO., INC.**, P.O. Box 46, Greenwood, SC 29648-0046, (803) 223-7333. Catalog free. *Celosia argentea* 'Apricot Brandy'.



*Tradescantia zebrina* 'Quadricolor'

**THOMPSON & MORGAN**, P.O. Box 1308, Jackson, NJ 08527-0308, (800) 274-7333. Catalog free. *Catharanthus roseus*, *Tagetes* 'Lemon Gem'.

**WAYSIDE GARDENS**, P.O. Box 1, Hodges, SC 29695-0001, (800) 845-1124. Catalog \$1. *Canna* 'Pretoria'.

**WOODLANDERS, INC.**, 1128 Colleton Avenue, Aiken, SC 29801, (803) 648-7522. Catalog \$2. *Barleria cristata*.

organic matter. Pinch them as they grow so they become bushy.

Another wandering Jew, *T. fluminensis*, also has violet leaf bottoms but bears white three-petaled flowers. It has a number of cultivars, including the popular green-and-white-striped 'Variegata'. Lacking purple pigment, it is best planted in shade. 'Variegata' is handsome between other plants with green-and-white variegated foliage, such as the caladium cultivar 'Candidum'.

### Oyster Plant

Although now merged into the same genus as wandering Jews, the oyster plant, *T. spathacea*, is quite different in form. Its eight- to 15-inch succulent, upright leaves—green on top and purple on the bottom—whorl around short stems. By standing erect, they flaunt their bright leaf undersurfaces, which are purple as an eggplant. But there is more to oyster plant than its great colored foliage and handsome form. Curious boatlike structures are anchored at the leaf bases. Like sailors dressed in white, small three-petaled flowers emerge one at a time throughout the year to steer the vessel, inspiring a host of evocative common names that include man-in-a-boat, Moses-in-a-boat, Moses-in-the-cradle, Moses-in-the-bulrushes, Moses-on-a-raft, and boat lily, as well as purple-leaved spiderwort. Until recently the plant was known as *Rhoeo spathacea*—although it sometimes masqueraded under the synonyms *R. discolor* or *Tradescantia discolor*—but *The New Royal Horticultural Society Dictionary of Gardening*, published in 1992, now lists it as *T. spathacea*. Sometimes taxonomists make gardeners want to jump out of the boat!

The upper leaf surfaces of the cultivar 'Vittata' (sometimes listed as 'Variegata') are longitudinally striped with pale yellow. A similar form, *T. spathacea* 'Minima', has leaves less than half as long. There is a variegated selection of this one that is exceptionally choice—and hard to find.

Native to Central America, *T. spathacea* has naturalized on limestone banks, in rocky thickets, and along woodland margins all over the West Indies. It is widely cultivated as a ground cover throughout warm countries, where stems arise from underground rhizomes to form a mass. The plant can be propagated easily from divided rhizomes, stem cuttings, or seeds. Seeds germinate readily; when I lived in Barbados I had to

weed out oyster plant seedlings.

Oyster plant culture is just as easy far north of the Caribbean. Last summer in my mother's small New York City garden, I planted *T. spathacea* 'Vittata' as a vertical element in the center of a classical iron container. Its golden lines glow in full sun, but it also survives shade and tolerates both moist and dry soils. It can be overwintered indoors on an east-facing windowsill.

Artistic gardeners will want to combine 'Vittata' with other golden-variegated foliage plants, such as the spotted *Abutilon pictum* 'Thompsonii' or *Canna* 'Pretoria'. The orange flowers of this canna cultivar contrast agreeably with the purple foliage of 'Vittata', while the golden stripes harmonize. The variegated acanthus—zebra plant (*Aphelandra squarrosa*), *Sanchezia speciosa*, and the golden form of caricature plant (*Graptophyllum pictum*)—also match. Try using small plants of these tropical shrubs as seasonal specimens. They propagate and grow quickly, so you can treat them as annuals. *Aphelandra*, the zebra plant, is widely available in garden centers.

True annuals can also be added into this display. The copper-colored cultivar of the plumed cockscomb, *Celosia argentea* 'Apricot Brandy', bears flowers the same shade as the stripes of 'Vittata'. It struts its feathery blossom like a peacock does its tail—not discreetly, but in vibrant tropical splendor.

Around 'Vittata', bed a dwarf marigold from the Pumila Hybrids group—*Tagetes* 'Lemon Gem' for example—for the masses of single yellow flowers on top of fine, fernlike foliage. Don't be afraid to experiment with other annuals. I recently saw a splendid combination of the plain purple *Tradescantia spathacea* next to large white hybrid Madagascar periwinkles (*Catharanthus roseus*), with the sky blue blossoms of Cape leadwort (*Plumbago auriculata*) weaving between.

I like these common plants—they are unpretentious and easy to grow. They evoke a sense of simpler times and simpler pleasures. Wandering Jews and their kin are not new, but their garden use can be. Be an artful gardener and make simple plants sophisticated by using them in new and often unexpected ways!

*Richard R. Iversen is a visiting lecturer in ornamental horticulture at the State University of New York College of Technology in Farmingdale.*



focus july/august

# the worm turns

PETER LUI



**EARTHWORMS ARE THE GOOD GUYS** and always a sign of healthy soil, right? Researchers in New York are finding that like the Jack Nicholson character in *The Shining*, a different environment—in this case a woodland rather than an old resort hotel—can make earthworms a bit diabolical. In less natural settings, however, they give abused soil needed nutrients and aeration. U.S. Department of Agriculture researchers are encouraging no-till planting on farms, and say it can work in our gardens as well.

In the United Kingdom, a different horror story unfolds with the spread of killer flatworms, which prey almost exclusively on earthworms. Here's a creature from a foreign land totally deserving of the name Alien. Not only can it live off its own body and turn its prey into soup in its slimy embrace, but it's capable of giving birth through a spontaneous Caesarean, and neatly healing itself up again. And we thought these things only happened on *The X-Files*.

## garden Jekyll, forest Hyde

by Will Nixon

In the mid-1980s, Richard Pouyat, then a soil ecologist for the New York City Parks Department, spent his days roaming the city's forest parks. Often he thought they seemed more like retirement homes for trees than natural forests. They had towering old specimens, but lacked the younger generation that should be patiently waiting in the understory to replace falling elders. Unlike rural forests—which rise in layers of shrubs, understory trees, and high canopies—many urban stands shot straight up from knee-high weeds to leafy ceilings.

Pouyat was surprised—and puzzled. Research has shown that downtown trees have much shorter life spans than those in suburban and rural areas; these New York City park trees, however, seemed older than those in the nearby countryside.



Their age and size could be explained by the age of the parks themselves. But the lack of understory trees or brush convinced him that something else was impairing natural growth processes, and he knew it had to be more subtle than overuse. Many New Yorkers retain a medieval-like fear of the remote corners of their parks as hideaways for thieves and sinners.

Pouyat, now a forest ecologist with the U.S. Forest Service, decided to start his search for answers in the dirt. "In my mind, the soil is a barometer in many ways for how an ecosystem functions," he says. It provides nutrients for the plants, collects pollutants, and helps determine what grows and what doesn't. (A hemlock stand, for instance, sheds needles that makes the soil repulsive to neighboring deciduous trees.)

In 1988 he joined Mark McDonnell and Steward Pickett of the Institute for Ecosystem Studies in Millbrook, New York, in launching a study of nine mature red oak forest sites, from the Bronx through suburban Westchester County in New York and northwest to rural Connecticut. At first, the researchers found what they expected. The urban soil had more than five times as much lead as rural soil, and two or three times as much copper and nickel. Over the years these heavy metals from automobile exhaust pipes and factory chimneys had settled as urban dust.

But they were surprised to find an even greater difference in the soils: The urban parks had been overtaken by earthworms.

### FRIEND OR FOE?

For centuries, people dismissed earthworms as wiggly pests, until Charles Darwin's book about them inspired new respect for their role in nature. Today farmers and suburban homeowners view earthworms as a blessing.

"In general, they enhance the fertility of the soil," says Patrick Bohlen, a researcher at the Institute for Ecosystem Studies, who has written his own book about the busy creatures. They decompose dead organic matter, help aerate the soil, dig out pores that absorb water, and create more room for roots to grow. And they seem so common—from

fish bait to food for robins on the lawn—that many people are surprised to learn that the earthworms found outside the South are usually invaders from Europe

the urban-to-rural forest studies in 1989. Farms and lawns are disturbed ecosystems that may be helped by the worms' presence. But they may be "unsettling" to

**"I would not enter on my list of friends, (Tho' graced with polished manners and fine sense, Yet wanting sensibility) the man, Who needlessly sets foot upon a worm."**—William Cowper (1731-1800)

and Japan. Ice Age glaciers drove native worms south from our northern states; the immigrant species arrived later in the root balls of plants and trees imported from abroad.

Many ecologists worry about non-native plants and animals invading our native ecosystems. Earthworms are no exception, although researchers have only lately discovered them in the forests after studying them on farms for years. Their effect there seems to be quite different.

"What's great for agricultural land may not be great for native forests," says Margaret Carreiro, an assistant professor of biology at Fordham University, who joined

northern forests, which have evolved since the last Ice Age without them.

### THE FOREST FLOOR

Before a worm invasion, country forests have a profusion of fungi, and their carpets of leaves sprout mushrooms. At her field station—the Louis Calder Center in Armonk, New York—Carreiro seems to be on the front lines of the urban worms' march north into suburban forests. All they may need are gardeners planting vegetation from nurseries or developers carving suburban lawns from the woods.

In a native forest, decaying foliage often lays three or four inches deep because some

leaves decompose very slowly. Red oak leaves, for example, take five years. This thick mat is full of fungi. Carreiro says a square meter of leaves one-and-a-half inches thick holds 500 to 5,000 miles of fungal filaments, a vast highway few people notice except when mushrooms sprout in late summer and fall.

The forest floor, in essence, acts as the ecosystem's stomach, transforming fallen leaves and plants, branches and tree trunks, and dead animals into nourishment for the next generation. And it proceeds at a finely calibrated rate that recycles 80 percent of the forest's nitrogen, slowly cannibalizing itself at a pace that wastes little food or energy.

But the earthworms change the nutrient cycle, shifting this stately pace into overdrive. By consuming new leaf litter in a year, rather than five or more years, they flood the soil with ammonium. Bacteria convert this excess plant food into nitrate, a much trickier com-

## Why Encourage Earthworms?

**Reduce runoff**—Earthworm burrows allow water to penetrate the subsoil, reducing erosion and making water available to plants.

**Improve soil aeration**—Burrows help oxygenate the soil, reduce compaction, and break up the hardpan.

**Increase organic content**—Earthworms pull plant residue underground where it can decompose.

**Speed up growth**—Earthworms break down growth inhibitors in organic matter and add growth stimulants.

**Increase nutrients and minerals**—Earthworm excretions improve availability of nutrients and minerals to plants, reducing the need for chemical fertilizers.

**Neutralize soil pH**—Earthworm-processed soil is always closer to neutral pH than the original soil.

**Promote beneficial microorganisms**—Earthworms carry beneficial microorganisms and mycorrhizal fungi down into the soil.

**Improve soil tilth**—Earthworm castings contain compounds that stabilize and aggregate soil particles, increasing water retention and reducing erosion.

**Reduce pests**—Earthworms eat harmful nematodes and create soil conditions that discourage their presence.

*From The Farmer's Earthworm Handbook: Managing Your Underground Money-makers by David Ernst.*



pound to absorb for many roots. But for other plants, Carreiro says, nitrate is a “special diet.” The Europeans, who spotted their forest earthworms long before we did, now identify some plants as “nitrophiles,” but Americans don’t yet know which of our trees and plants love it or hate it.

Over time, however, worm-infested forests could be filled with our own “nitrophiles.” Pouyat has begun studying the Norway maple’s appetite for nitrates. If the exotic species turns out to be well-adapted to our changed soils, it may be that urban foresters and others are waging a futile campaign to cut them down.

Nitrate leaches from the soil much faster than ammonium. In theory, the forest could slowly starve itself by dissipating this vital nutrient, because nitrogen, unlike minerals, does not occur naturally in the soil. And this leaking nutrient could alter surrounding ecosystems.

“When the nitrates get into lakes, rivers, and estuaries, the algae love it,” Carreiro says. The algae decompose and rob oxygen from water, killing fish and invertebrates.

In the forest, worms turn what should be a thick brown carpet of old foliage into a threadbare sheet of leaves or plain black dirt, and displace the fungi, bacteria, and tiny invertebrates. Large patches of ground look as bare as the dirt around a potted plant. What this ultimately means for the forest is hard to gauge.

#### WHERE HAVE THE FLOWERS GONE?

To Carreiro, a fungi aficionado, the forest at the Louis Calder Center simply doesn’t look right, and she’s not just referring to aesthetics. “Where are all of the trilliums, the mosses, the trout lilies, the Canada mayflowers?” she asks. Maybe the crush of hungry suburban deer is to blame—or maybe the ground no longer nourishes these woodland natives.

What other effect could the worms have on the forest? In the country forest, the thick mat of leaves hides large tree seeds, like acorns, from chipmunks and squirrels. The litter is fertile ground for seeds of mature forest trees: oaks, hickories, beeches, butternuts, walnuts, and others. The small seeds that flutter down as wings or buttons from maples, ashes, and elms often get buried in these damp leaves and rot. But if worms devour the leaf litter, Carreiro suggests, the predators might feast on the exposed bounty of acorns or nuts, making it possible for the smaller seeds to flourish. Over time, the forests could convert from large-seeded trees to small-seeded ones. Good-bye oaks, hello maples.

Now that they have uncovered this tale of two soils, Carreiro, Pouyat, and other scientists must untangle the more complicated stories of full-forest ecosystems. Urban forest managers await their results.

“We can’t figure out where our leaf litter goes,” says Marianne Cramer, planner for the Central Park Conservancy. In the park’s north woods, the ground is soon bare no matter how many leaves are shed each fall. Do earthworms eat them? Do they blow away without the mortar of fungal filaments?

“It worries us,” Cramer says, adding that “worms may not be the most threatening creatures in Central Park, but they could be changing the forests as indelibly as anything else.”

*Will Nixon is a free-lancer living in New York City. A version of this article appeared in the Autumn 1995 American Forests.*

## killer worms

Just as gardeners are learning to fully appreciate the importance of earthworms to good soil, along comes a threat to the existence of our subsoil samaritans. Gardeners in the United Kingdom are battling the spread of a flatworm, accidentally introduced from New Zealand, that preys almost exclusively on common earthworms. Preliminary studies in Northern Ireland and Scotland indicate that in some areas

where earthworms have been reduced below detectable levels, soil drainage is adversely affected. Worse, undaunted by its own voracity, the flatworm does not die for lack of food once it has depleted the supply of earthworms, but can survive for up to a year by reabsorbing its own tissue.

Although it does not appear likely that the flatworm (*Artioposthia triangulata*) could spread to North America, its appetite for earthworms is cause for concern to gar-

## Resources

**The Farmer’s Earthworm Handbook: Managing Your Underground Money-makers.** David Ernst. Lessiter Publications, Brookfield, Wisconsin. 1995.

**Worms Eat My Garbage: How to Set up and Maintain a Worm Composting System.** Mary Appelhof. Flower Press, Kalamazoo, Michigan. 1982.

deners and farmers everywhere. Scientists fear that, unchecked, the flatworm invasion could have wider ecological effects because earthworms are an important element in the diet of birds and other wildlife.

The flatworm was discovered in Northern Ireland in the 1960s—likely arriving in the media of plants imported from New Zealand—and has since been found in Scotland and parts of England. Little notice was taken of the flatworm until the late 1980s, when researchers were able to link the invader to the disappearance of earthworms in parts of Northern Ireland.

The worm is dark brown and flattened, with cream-speckled margins. Mature worms are up to six inches long in repose, but can be twice as long when moving. Unlike earthworms, flatworms do little to improve soil, preferring to live close to the surface unless in pursuit of a meal. Flatworms can often be found wallowing in their own mucus under stones, pieces of wood, or landscape fabric overlying damp, bare soil. Flatworms do appear to be limit-



ed by temperature and soil moisture, seeking refuge underground when the soil dries out or temperatures go below freezing or above 70 degrees Fahrenheit. This factor, along with a lack of natural predators, explains their rapid spread in the United Kingdom, where soils are cooler and wetter than in their native New Zealand.

The flatworm has attracted attention in part because of its sinister appearance and the rather macabre way it devours its prey.



On encountering an earthworm the flatworm gives chase, sometimes altering its body shape to follow the hapless earthworm underground. After cornering its victim the flatworm coils itself around the earthworm and releases mucuslike digestive enzymes that dissolve the earthworm's tissue. In less than an hour the liquified earthworm can be ingested. Some British gardeners have complained of skin irritation after handling flatworms.

In an attempt to limit the infestation, flatworms have been listed under the Countryside and Wildlife Act, which prohibits the knowing spread of listed organisms. But until chemical or biological controls can be found, flatworms appear likely to continue to flourish in their adopted land or, even worse, spread to European countries with mild, damp climates similar to the United Kingdom's. Apparently better adapted to slightly drier and warmer conditions, another flatworm (*Australoplana sanguinea*)—introduced to southwestern England from Australia in the 1970s—has spread throughout southern and central England. American gardeners can only hope the flatworms don't have other relatives adapted to even warmer climates.

## all washed up

So the Big Worm said to the Little Worm: "You don't even have enough sense to go out in the rain..."

Why *do* worms litter the sidewalks after a rain? According to Agricultural Research Service (ARS) entomologist Edwin Berry, it isn't to keep from drowning. In experiments at the National Soil Tilth Laboratory in Ames, Iowa, worms have lived underwater for several weeks. On the other hand, he says, that water must be well oxygenated, and the rain may reduce available oxygen.

Berry, who has studied worms for a decade for this U.S. Department of Agriculture agency, has several other theories:

- They're irritated by a sudden increase in acidity when rain mixes with their urine.
- They're taking advantage of the cool, moist, overcast conditions to scout out new feeding grounds.
- They enjoy a shower.

"There's still a lot," Berry told *Agricultural Research* magazine, "that we don't know about worms."

Worms can be called forth by all sorts

of disturbances: chemicals—ARS researchers in Ames use a one-half percent formaldehyde solution to flush them out for studies, rinsing them later with water; electricity—electric worm probes were marketed to fishermen, says Berry, until people started getting electrocuted; and vibrations—it's said they come out before an earthquake, and some fisherman go worm hunting by pounding the ground with their fists or running a saw across a sapling stuck in the ground.

## no more tills

New research by soil scientists is causing farmers and gardeners to re-evaluate that spring compulsion to fire up the tiller. It seems the benefits of having earthworms in the soil outweigh the benefits of tilling. Earthworms are being touted as "nature's no-till plow," helping to reduce erosion and the need for chemical fertilizers while improving the structure of soil (see "Why Encourage Earthworms," page 50). Tilling breaks up worm burrows and exposes earthworms to the sun and to predators.

## Cybergardening Robots in the Flower Bed

by Terri J. Huck

Gardeners from all over the world collaborate on a garden, nurturing plants with the assistance of a robot and discussing concerns while connected only by computers and modem lines.

No, it's not the latest episode of *Star Trek Voyager*. It's the Tele-Garden on the World Wide Web, developed by robotics specialists at the University of Southern California (USC) School of Engineering. Project leaders are Ken Goldberg, now an assistant professor of industrial engineering at the University of California-Berkeley, and Joseph Santarromana, a Los Angeles-based multimedia artist.

The garden "plot" is a circular planter six feet in diameter under fluorescent lights indoors at the USC School of Engineering. Gardeners who join the Tele-Garden cooperative can plant seeds, water them, and monitor their progress through the remote manipulation of a robot arm.

The experimental site was created and is maintained entirely by volunteers; the robot is on loan from Adept Technology, Inc. An earlier project by some team members involved using an industrial robot for remote excavation of a sand-filled archeological site. "Such hunting and gathering characterizes existing Internet protocols," wrote the team. "The Tele-Garden



The Tele-Garden site on the World Wide Web introduces users to robotics technology and "virtual" communities.

was designed to consider 'post-nomadic' protocols, where survival favors those who collaborate."

According to Steven Gentner, Tele-Garden site program-

mer, "The beauty of the project is that it is not autonomous but instead reacts to the requests of those across the Net. It certainly appears that the robot is alive and knows what



## Earthworm Factoids



- There are at least 3,000 species.
- Most earthworms in U.S. soil are not natives.
- The largest earthworms in the world—mostly in the Southern Hemisphere—measure three to five feet long, an inch in diameter, and weigh up to 1.3 pounds.
- The most common earthworms in the United States are the green worm (*Allolobopora*

*chlorotica*), the pink soil worm (*Aporrectodea rosea*), southern worm (*A. trapezoides*), pasture worm (*A. turgida*), red marsh worm (*Lumbricus rubellus*), night crawler (*L. terrestris*), and woodland white worm (*Octolasion tyrtacum*).

• In an acre of good soil, researchers have found more than a million worms and 1,200 miles of earthworm holes.

• Eight worms can produce 1,500 offspring in six months.

• It's estimated that in a one-acre field with 25 earthworms per square foot, the castings will give the soil four pounds of nitrate, 30 pounds of phosphorus, 72 pounds of potash, 90 pounds of magnesium, and 500 pounds of calcium each year.

• If you cut a worm in half, you will not get two worms. If the head half still has seven or eight segments, you will still have one worm. If not...you should be more careful with your spade in the future.

To stimulate earthworm populations, many farmers are adopting no-till agriculture—planting crops alongside the residue from the previous year's harvest while reducing weeds with cover crops, light cul-

tivation, or herbicides. To add nutrients to the soil, they use green manure or compost since worms are sensitive to the salt residue left by synthetic fertilizers.

Back-yard ornamental and vegetable

gardeners can use similar techniques to increase earthworm populations. According to Martin Shipitalo, a research soil scientist with the USDA Agricultural Research Service's North Appalachian Experimental Watershed in Coshocton, Ohio, the key for home gardeners is to ensure that the worms have plenty of food. "Adding mulch or leaving crop residues is important—the more organic matter you have, the more the earthworm population will increase," he says.

Earthworms also require soil that stays reasonably moist but not waterlogged. If you have extremely sandy or poorly drained soil, it won't be enough just to leave last year's crops and cut back on chemicals. Such soil can only be improved by gradual incorporation of organic matter and creation of raised beds. If you have soil with relatively good texture but few earthworms, however, reducing tilling and replacing chemical fertilizers with partially decomposed compost and green manure will eventually coax earthworms back into your garden. Some authorities suggest purchasing earthworms in bulk to "seed" your garden, but Shipitalo says in most cases that is unnecessary—the worms will migrate in from surrounding soil.

it is doing, but in fact it is responding to a collective intelligence that exists in many different locations. Two heads are better than one...imagine if you have thousands."

Indeed, more than 7,000 gardeners have logged in from such farflung places as Louisville, Kentucky; Rome, Italy; and Seoul, Republic of Korea. Although the project team set up the site as a cooperative, they were intrigued by how important a sense of community is to gardeners online and added a "village square" area to allow Tele-Gardeners to communicate with each other. Faculty at the USC Annenberg School of Communication conducted a focus group study of Tele-Gardeners to analyze the ramifications of such electronic interactions on our understanding of community and cooperation.

**Gardeners can visit the Tele-Garden site at least until August at <http://www.usc.edu/dept/garden>. For details on the focus group study, see <http://www.usc.edu/dept/annenberg/museum/study.html>.**

Being at the beck and call of gardeners 24 hours a day can wear out even the most dedicated robot. Gentner says both software and hardware problems occasionally cause downtime.

"Whenever you bring a highly engineered piece of equipment such as a robot together with wet soil, you're bound to have problems," he says, "but we try our best to keep it online."

In January the team, taking a cue from Mother Nature's tendency to clean house occa-

sionally, uprooted the garden and filled it with fresh soil.

They also proposed some changes to their hands-off agrarian policy: Members were asked to establish "colonies" of three or more gardeners—complete with elections for leaders and a designated area for posting policies and recruiting new members. Each gardener would be able to plant one seed in order to accommodate thousands of gardeners tending one small flower bed. As befits a democracy, however, the team polled Tele-Gardeners before implementing the changes. Due to concerns about additional regulations and time constraints, the community vetoed the colony idea.

### REAPING AWARDS

Says Gentner: "Given that the home user can experience at

least a little of what it feels like to extend one's reach across the country or even the world, the Tele-Garden is a remarkable achievement."

Others clearly agree. Tele-Garden has won several awards and been covered in both gardening and computer magazines. In bestowing first prize to Tele-Garden at the 1995 Festival of Independent Visual Arts, the jury wrote, "For its engaging use of the Web, bringing together an international group of strangers to explore and nourish nature in sharing a common garden, the First Prize goes to the Tele-Garden as a powerful metaphor for virtual communities."

And maybe even for those that are more than virtual.

*Terri J. Huck is managing editor of The American Gardener.*





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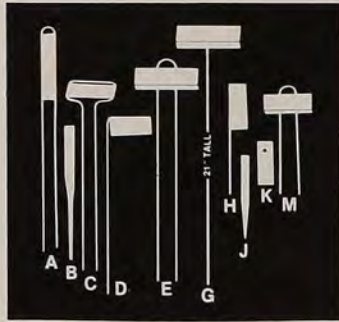
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## book reviews

🌿 *collectors' plants*

🌿 *a year of trees*

🌿 *a world of palms*

### THE COLLECTOR'S GARDEN: DESIGNING WITH EXTRAORDINARY PLANTS

Ken Druse. Clarkson N. Potter, Inc., New York, 1996. 248 pages. 8 1/2 x 11 1/4".  
Publisher's price: hardcover, \$45. AHS member price: \$40.

For several years Ken Druse has been turning out a series of superb books that emphasize the natural landscape. In this new one he paints a series of visual and textual portraits of 28 gardens and their owners, from all over the United States. Not all of these gardens are grand, but each reflects its owner's love of plants.

Druse divides his collectors into four somewhat arbitrary categories: the hunters, who seek out the new and different; the missionaries, who are either striving to preserve threatened plants or who want the rest of the world to share their enthusiasms; the specialists, who focus on a particular kind of plant or habitat; and the aesthetes, who collect plants for their appearance and design value.

The reader is instantly struck by the high quality of design in virtually all of these gardens. This reinforces the idea that a successful garden requires an eye for a variety of details—such as shape, color, texture, and scale—so that each plant is juxtaposed with its neighbors in a complementary way. These effects do not come easily; doubtless the plants in all these gardens have been moved around many times. But in every case the

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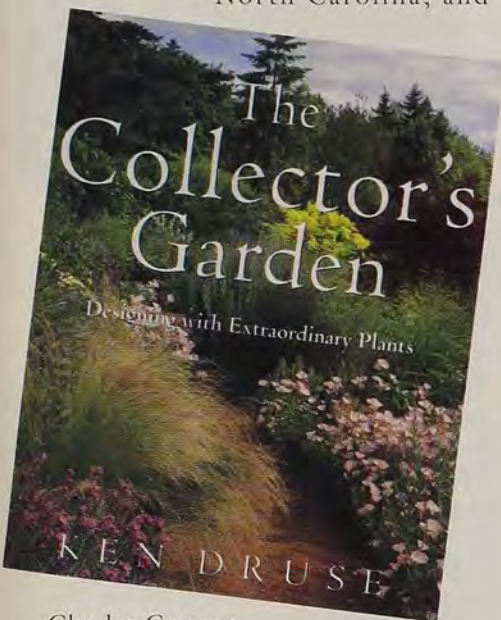
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plants have been placed within a clear, logical framework.

For instance, the extraordinary collection of Harold Epstein in Westchester, New York, fits comfortably within a woodland setting, full of paths to lead visitors pleasurably through the garden. John Gwynne's garden in Rhode Island is much more geometrically arranged, providing a series of rooms to view small plants up close and axes to lead the visitor on to other rooms. In the San Francisco Bay area garden of Diane and Jon Spieler, the Spanish-style architecture provides a strong setting in which to show off a collection of roses.

Among the gardens Druse considers are those of horticultural professionals, including Dan Hinkley of Heronswood Nursery, Rick Darke of Longwood Gardens, Nancy Goodwin of Montrose in North Carolina, and

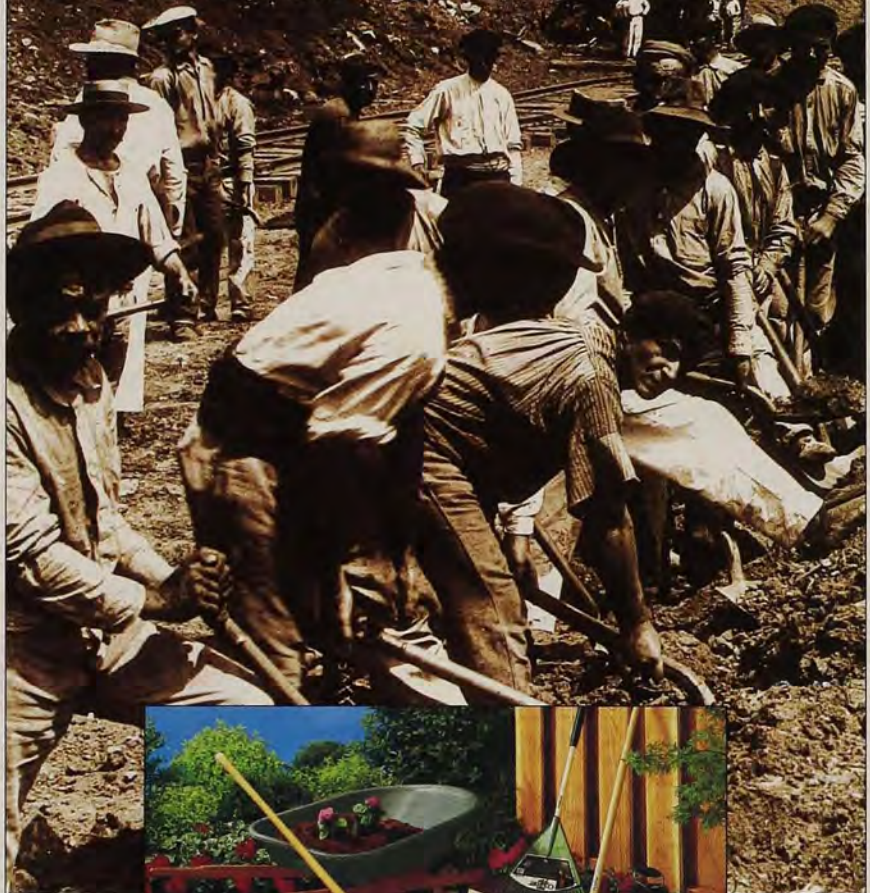


Charles Cresson of Hedgeleigh Spring in Pennsylvania. Each of their gardens is strongly designed, but the high point illustrated is Goodwin's central garden, overflowing with orange and red flowers set off by purple foliage and all framed by a spectacular lathe house.

Throughout, Druse emphasizes that plants are high maintenance and perishable collectibles and is careful to point out that "accumulating is not collecting." In order not to be overwhelmed it is important to use discrimination when starting or adding to a collection. The rare need not necessarily be expensive, however; many gardeners are delighted to share their treasures.

As we have come to expect, Druse's abundant photographs are luminous and very true in color. They complement the

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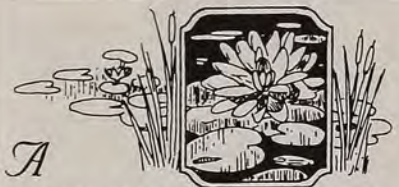
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sensitivity of the text and make clear the author's own passion for plants. In addition to panoramic views of individual gardens, there are wonderful close-ups of blossoms and leaves, including a most effective page of different pulmonarias that vividly illustrates the range of spotting on the leaves. Looking at these gardens through Druse's eyes makes one aware how important the quality of light is in a garden. Shadows and reflections are an integral part of any beautiful setting.

Although you hate to come to the end of the main text, the final section of the book contains useful discussions of topics such as plant propagation, the meanings of many botanical terms designating color and hue, and importing plants. There is also an excellent list of mail-order nurseries.

My only reservation about this book relates to layout. Druse was clearly eager to include as many images as possible, for which we should all be grateful. In some cases, however, I would have preferred the captions closer to the specific photos.

That aside, this is truly a fine book. It's a bit large for the bed table, yet far too informative to be relegated to the coffee table. Keep it in a place where you can look into its pages frequently, whether you are seeking inspiration, affirmation, or reassurance. You will be richly rewarded.

—Sarah S. Boasberg

A landscape designer and immediate past chairman of the American Horticultural Society's Board of Directors, Sarah S. Boasberg gardens in Washington, D.C.

### THE YEAR IN TREES

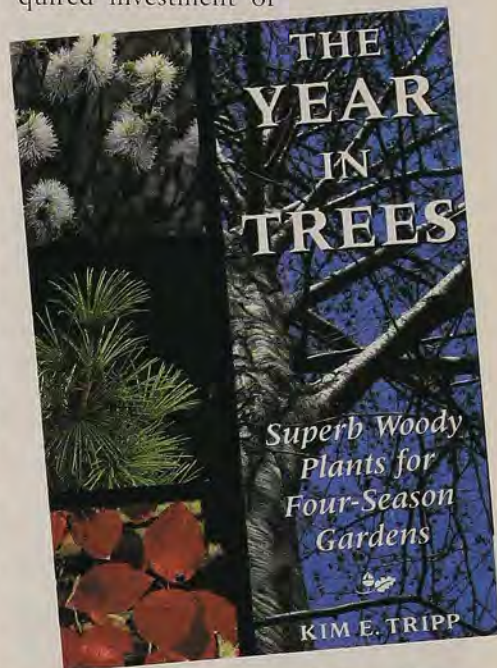
Kim E. Tripp and J. C. Raulston. Timber Press, Inc., Portland, Oregon, 1995. 204 pages. 7 1/2 x 10 5/8". Color photographs. Publisher's price: hardcover, \$44.95. AHS member price: \$40.

You might recall the television advertisement: "When E. F. Hutton talks...people listen." American gardeners should have the same reaction to two of the most respected horticulturists in this country offering their collective wisdom. I can already hear the hush.

With most of American horticulture still buried in the wave of perennial fever that has stormed our country during the past decade, it is unlikely that many gardeners have yet realized what is about to roll down the pike. If they should (in high season) lift their heads above their billowing summer borders, they might see the legions in the distance about to bear down. In winter, with flattened gardens

devoid of any structure, they may just notice the impending arrival. The woody plants have landed.

American horticulturists no longer need spend valuable gardening time evaluating an often overlooked but much required investment of



gutsy structure to their gardens. Two of the finest plantspeople in this country have accomplished the chore for them, distilling what might be a daunting selection of possibilities to a fine vintage of 150 simply terrific plants.

Tripp combines keen plantsmanship, scholarly aptitude, and an extraordinary literary talent to suggest and describe the woody plants best considered for inclusion in North American gardens. In a collaborative effort with Raulston, icon of the rebirth of American horticulture, the reader is taken on a concise but entertaining tour of the four-season landscape.

Most appreciated by this reader is the fact that not only are the new and rising stars of horticulture included, but also those oft-neglected, sturdy stalwarts generally dismissed as old hat. The familiar panicked hydrangea (*Hydrangea paniculata*) is afforded the same determined enthusiasm as *Euscaphis japonica*, a stunning deciduous tree with "romantic red hearts opening to reveal shiny, jet-black beads in autumn." This was a species virtually unknown in this country until Raulston helped introduce it following the 1985 U.S. National Arboretum expedition to Korea.

Each engaging description is well supported by excellent photographs, most taken by Raulston himself. Had every photograph been identified by scientific



nomenclature rather than by common name, the entire effort might have been flawless; yet even in this oversight I can find entertainment. With an unfamiliar common name accompanying an intriguing (and beautifully captured) specimen in its seasonal prime, the reader is enticed to scour the text to discover its botanical identity.

This is a book for beginners and this is a book for the most jaded of plantspeople. I need not shout or demand that you add it to your library. This is a book that will, of its own accord, make America listen.

—Daniel Hinkley

*Co-owner of Heronswood Nursery in Kingston, Washington, Daniel Hinkley writes and lectures frequently on a wide range of horticultural topics.*

### PALMS THROUGHOUT THE WORLD

David L. Jones. *Smithsonian Institution Press, Washington, D.C., 1995. 410 pages. 7 1/2 x 10 1/2". Color photographs. Publisher's price: hardcover, \$49. AHS member price: \$44.*

Being familiar with two of the author's previous works, I eagerly anticipated this book and I certainly was not disappointed. Chalk up another solid score for the man from Down Under.

On first glance, one is drawn to Part Two, an alphabetical presentation of 800 species by scientific name. Thanks to the quality of the photographs, this section will give even the most novice palm fans an appreciation for the vast array of sizes, colors, textures, and styles of palm "trees." For the more advanced enthusiast, it is yet another reminder of the beauty and diversity of our favorite family of plants.

This section is much more than just pretty pictures. Each palm genus is introduced with general information, including native range, overall characteristics, notes on cultivation, and propagation techniques. Following this is a succinct description of individual species within each genus. No other book on palms has done this any better, or covered nearly the number of species. My only regret is that it was not possi-

ble to include photographs of each one.

Turning your attention to Part One, titled "The Nature of Palms," is well worth the effort since it contains a bonanza of information. One learns, for example, that the majority of palms have pinnate leaves and that the southernmost occurring palm is the feather-duster palm (*Rhopalostylis sapida*), a native of New Zealand. Excellent line drawings supplement text describing all the structural features of palms. Through the years I have suggested to my students that palms—especially coconut—are just as important to residents of the tropics as grasses—especially wheat—are to people of the temperate zones. Ample support for this argument is presented here, although not every one of the 1,000 different uses for coconut palms is accounted for!

Considerable attention is given in this section to all aspects of palm cultivation, including lists of species suitable for both indoor and outdoor container culture. Because I teach landscape pest control classes, the chapter on pests and diseases was of particular interest to me. One must keep in mind, however, that the

book is international in scope, so many of the pests described do not occur in this country. Additionally, some of the pesticides discussed are known by other names in the United States, so readers should rely on local sources of advice, such as county Extension offices. Excellent information on using fertilizers and on remedying nutrient and element deficiencies is provided, with one notable exception: There is no mention of manganese deficiency, which causes "frizzle-top" disease in several palms in Florida and elsewhere. In addition, use of metric units of measurement may be a minor inconvenience for some. It's a small price to pay for good information.

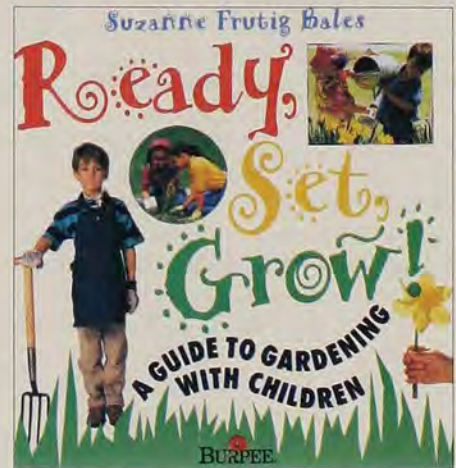
—Kyle E. Brown

*A professor of landscape technology at Lake City Community College in Florida, Kyle E. Brown is a member of the board of directors of the International Palm Society.*

## gardeners' books

*Books are chosen for the AHS Horticultural Book Service based on perceived reader interest, unusual subject matter, or substantive content. The following descriptions are not intended to be critical reviews, but are written to give an overview of the books' contents. For further information about these or other gardening books—or to order books—please call Barbara Catherwood at (800) 777-7931 ext. 36.*

### GARDENING WITH CHILDREN



### READY, SET, GROW: A GUIDE TO GARDENING WITH CHILDREN

Suzanne Frutig Bales. 1996. 130 pages. *Publisher's price: softcover, \$17.95. AHS member price: \$16.25.*

Full of colorful pictures children will enjoy looking at, this book is loaded with good, workable ideas for getting children interested in gardening and the natural environment surrounding them.

Book code: MAC 021

### CONTAINER GARDENING

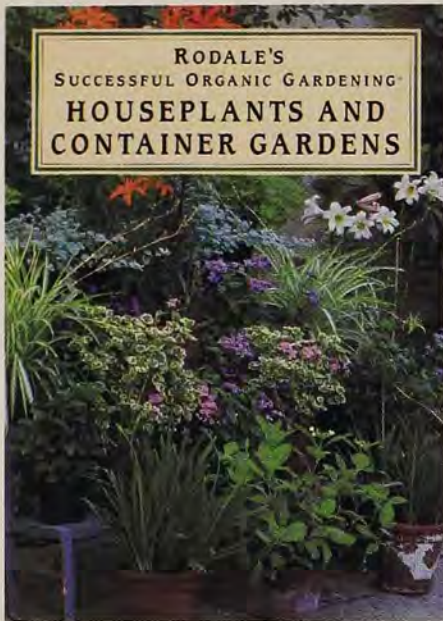
### BASKETS: INDOOR, OUTDOOR, PRACTICAL, DECORATIVE NEW

Pien Lemstra. 1995. 141 pages. *Publisher's price: hardcover, \$24.95. AHS member price: \$22.45.*

Filled with elegant, functional ideas for natural flower arrangements using baskets, this handsome book also covers the history of baskets and their use in the garden and home. More than 130 color photographs and illustrations.

Book code: ABR 004





### HOUSEPLANTS AND CONTAINER GARDENS

NEW

From Rodale's Successful Organic Gardening Series. 1996. 160 pages. Publisher's price: softcover, \$14.95. AHS member price: \$13.45.

Clear and complete instructions on growing and maintaining potted plants indoors and out. Includes encyclopedic sections on house plants and on flowering and edible plants for garden containers.

Book code: ROD 014

### MOVABLE HARVESTS

NEW

Chuck Crandall and Barbara Crandall. 1995. 128 pages. Publisher's price: softcover, \$19.95. AHS member price: \$17.95.

This book explains how vegetables, fruits, and berries can be grown in accessible containers for maximum productivity. It also shows how containers can extend the growing season in cold climates. With more than 100 color photographs.

Book code: CHA 003

## GARDEN MAINTENANCE

### THE GARDENER'S BUG BOOK: EARTH-SAFE INSECT CONTROL

Barbara Pleasant. 1994. 160 pages. Publisher's price: softcover, \$9.95. AHS member price: \$8.95.

A guide to help the home gardener identify and control more than 70 common garden insects using homemade and commercial control strategies. Includes ideas for gardens designed to entice beneficial insects and birds. Includes black-and-white photographs and illustrations.

Book code: STO 004

### THE GARDENER'S WEED BOOK: EARTH-SAFE CONTROLS

NEW

Barbara Pleasant. 1996. 160 pages. Publisher's price: softcover, \$12.95. AHS member price: \$11.50.

A very useful tool in the battle against weeds, this book assists in identifying more than 50 common garden weeds, offers time-saving tips for their management, and has suggestions for putting weeds to practical uses. With 50 black-and-white photographs and 100 line drawings.

Book code: STO 041

### RODALE'S PEST AND DISEASE PROBLEM SOLVER

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Linda Gilkeson, Pam Peirce, and Miranda Smith. 1996. 384 pages. Publisher's price: hardcover, \$26.95. AHS member price: \$24.25.

Subtitled "A Chemical-Free Guide to Keeping Your Garden Healthy," this useful book includes a field guide to more than 100 pests and diseases as well as A-to-Z coverage of nearly 200 plants. More than 250 color photographs and 150 illustrations help with identification and trouble-shooting.

Book code: ROD 015

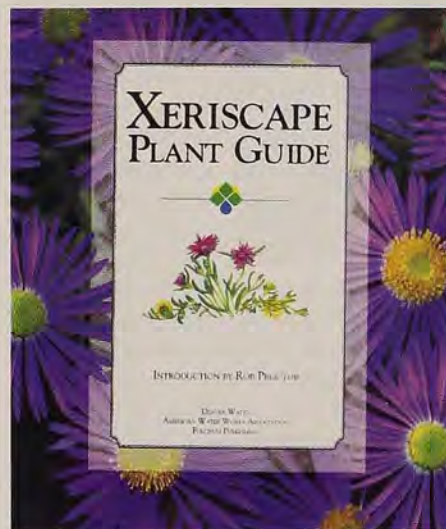
### NATURE'S REVENGE: THE SECRETS OF POISON IVY, POISON OAK, POISON SUMAC, AND THEIR REMEDIES

NEW

Susan C. Hauser. 1996. 130 pages. Publisher's price: softcover, \$13.95. AHS member price: \$12.50.

A great little, updated guide to a sore subject. With black-and-white photographs and illustrations.

Book code: LB 001



### XERISCAPE PLANT GUIDE

NEW

Denver Water, the American Water Works Association, and Fulcrum Publishing. 1996.

176 pages. Publisher's price: hardcover, \$34.95. AHS member price: \$31.45.

An encyclopedic guide to more than 100 low-water-use plants that add beauty and diversity to the home garden. Divided into sections on trees and shrubs, perennials and vines, ground covers and grasses, annuals, and shade plants. Includes 458 color photographs and botanical illustrations.

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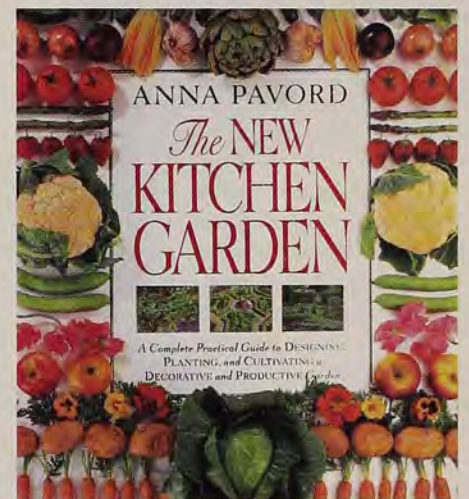
## VEGETABLES

### GROW YOUR OWN CHINESE VEGETABLES

Gerri Harrington. 1994. 288 pages. Publisher's price: softcover, \$12.95. AHS member price: \$11.50.

A favorite of one of our AHS interns. An all-inclusive how-to on finding, growing, and cooking Chinese vegetables. With line drawings.

Book code: STO 040



### THE NEW KITCHEN GARDEN

NEW

Anna Pavord. 1996. 208 pages. Publisher's price: hardcover, \$29.95. AHS member price: \$26.95.

From a well-known British writer, a beautiful and useful book on designing, planting, and maintaining an attractive and productive culinary garden. More than 500 color photographs.

Book code: DK 010

### THE SMART GARDENER'S GUIDE TO GROWING VEGETABLES

NEW

Dr. Bob Gough. 1996. 268 pages. Publisher's price: softcover, \$16.95. AHS member price: \$15.25.

From starting seeds and preparing the soil to rotating crops and fighting pests and diseases, this book provides a wealth of information from Gough, a horticulture professor at Montana State University. Contains line drawings and tables.

Book code: STA 005



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### MID-ATLANTIC

**JULY 20 ■ World Greenfest.** Children's festival. Lewis Ginter Botanical Garden, Richmond, Virginia. (804) 262-9887.

**AUG. 1 ■ Shade Garden Tour.** Meadowlark Gardens Regional Park, Vienna, Virginia. (703) 255-3631.

**AUG. 24 ■ Native Plant Sale and Seminar.** Irvine Natural Science Center, Stevenson, Maryland. (410) 484-2413.

### NORTH CENTRAL

**JULY 13-14 ■ Garden Glory Tour.** Private gardens. Rockford, Illinois. (815) 965-8146.

**JULY 19-20 ■ Olbrich Home Garden Tour.** Private gardens. Olbrich Gardens,

Madison, Wisconsin. (608) 246-4551.

**JULY 20-21 ■ Flower Show and Sale.**

Cook Energy Information Center, Bridgman, Michigan. (800) 548-2555.

**JULY 27-31 ■ American Phytopathological Society and Mycological Society of America Joint Annual Meeting.** Indiana Convention Center/RCA Dome, Indianapolis, Indiana. (612) 454-7250.

**AUG. 10-11 ■ Victorian Garden Walk.** General Crook House Museum, Omaha, Nebraska. (402) 455-9990.

### NORTHEAST

**JULY 9 ■ Tour of Caprilands Gardens.**

Tour and lecture by Adelma Simmons. Plimoth Plantation, Plymouth, Massachusetts. (508) 746-1622 ext. 508.

**JULY 13 ■ The Hidden Gardens of Cornish.** Garden tour of Cornish, New Hampshire. Historic Windsor, Inc., Windsor, Vermont. (802) 674-6752.

**JULY 20 ■ House and Garden Tour in West Stockbridge.** Lenox Garden Club, Lenox, Massachusetts. (413) 298-3089.

**JULY 20 ■ New London Garden Tour.** Garden Conservancy/The Fells, Newbury, New Hampshire. (603) 763-4789.

**JULY 27 ■ Rutgers Gardens Open House.** New Brunswick, New Jersey. (908) 932-8451.

**AUG. 3 ■ Herbal Medicine Lecture by Steven Foster.** Old Sturbridge Village, Sturbridge, Massachusetts. (508) 347-3362 ext. 270.

**AUG. 3 ■ Milford Garden Club's Garden Tour.** Private gardens. Milford, Pennsylvania. (717) 296-2967.

**AUG. 3-4 ■ Garden Trail Tour.** Conway, New Hampshire. (603) 447-5988.

**AUG. 9-11 ■ Northeast Organic Farming Association Conference.** Hampshire College, Amherst,

## Lawns with Less Water

Seattle residents interested in reducing water use in their gardens can visit the new Lawn Research and Demonstration Garden at the Center for Urban Horticulture at the University of Washington. Co-developed by Seattle Water, the demonstration area is a one-half acre garden designed to help visitors make informed landscape choices.

The garden is divided into 16 lawn plots that demonstrate four soil preparations and two watering regimens. Additional lawn-related demonstrations include: subsurface drip irrigation; irrigation using reclaimed wastewater; "Ecoturf," a mix of lawn grasses and drought-tolerant broadleaf perennials; and a swale for site drainage. Four ornamental areas feature plantings that require relatively little maintenance and water once they are established.

For more information, contact the Center for Urban Horticulture at (206) 543-8616.

Massachusetts. (508) 355-2853.

**OCT. 23-26 ■ Natural Areas in Urban Settings.** Natural Areas Association's Annual Conference. Pheasant Run Resort, St. Charles, Illinois. (314) 878-7850.

### NORTHWEST

**SEPT. 16-18 ■ International Society of Arboriculture's Training Conference.** Pacific Northwest Chapter. Yakima Convention Center, Yakima, Washington. (206) 784-1945 or (800) 335-4391.

### SOUTH CENTRAL

**JULY 25 ■ Christmas in July Herbal Workshop.** Ozark Folk Center, Mountain View, Arkansas. (501) 269-3851 or (800) 264-3655.

**JULY 27 ■ Floral Photography Workshop: Close-ups.** D. William Johnson, instructor. Loose Park Rose Garden, Kansas City, Missouri. (316) 343-7162.

### SOUTHEAST

**JULY 21 ■ Kudzu Konnections.** Lecture. Daniel Stowe Botanical Garden, Belmont, North Carolina. (704) 825-4490.

**JULY 24-27 ■ Conference on**

## Pollinators at the National Zoo

The "Pollinarium," which opened in April at the Smithsonian's National Zoo in Washington, D.C., celebrates the natural relationship between pollinators and plants. This colorful garden planted with Egyptian starflower (*Pentas lanceolata*) and butterfly bush (*Buddleia davidii*), along with dozens of other flowering plant species, is enclosed in a 1,250-square-foot greenhouse and serves as a home to hummingbirds and hundreds of butterflies such as zebra long-wing, cloudless sulphur, Gulf fritillary, white peacock, queen, and orange julia.

Among the highlights are a six-foot-tall model of a sage flower with a four-foot honeybee, a life-sized re-creation of a blooming saguaro cactus and pollinating bat, and an acrylic-enclosed bee hive large enough to allow a family to step inside and safely watch the activities of thousands of honey bees.

The "Pollinarium" is open Wednesday through Sunday from 10 a.m. to 4:30 p.m. Admission to the National Zoo is free.



source Guide, P.O. Box 206, Gowanda, NY 14070-0206.

### NORTHERN ROSE GROWER GUIDE

**R**oses for the North, a guide to hardy roses for northern growers, has been published by the Minnesota Extension Service. Based on the observations of researchers at the Minnesota Landscape Arboretum in Chanhassen over several seasons, the 96-page report rates 196 rose cultivars and species based on floral traits, bloom pattern, plant size and habit, disease and insect tolerance, and extent of winter injury.

The arboretum is in USDA Zone 4a, which stretches across the northern United States from Idaho to Maine and extends north into parts of British Columbia, Ontario, Quebec, Newfoundland, and New Brunswick.

Illustrated with color photographs, charts, and tables, the report also includes recommendations on buying plants, selecting planting sites, providing winter protection, and controlling pests.

The cost is \$11.95 plus shipping and applicable sales tax. For credit-card orders, call (800) 876-8636; ask for item MR-6594-NR. Minnesotans can also purchase the report at county Extension offices.

### FOUND: THE SEED GUILD

**A** member recently called the American Horticultural Society seeking an address for the Seed Guild in Scotland. We failed to find it, and failed to keep the member's name.

Now we have the answer, courtesy of the April *American Cottage Gardener*.

The Seed Guild, its editors tell us, was founded by Duncan McDougall, who gets seeds from 18 botanic gardens in Austria, Canada, Chile, China, Germany, Hungary, Russia, South Africa, the Ukraine, and the United Kingdom. For information on obtaining seeds and a sample, send \$3 in U.S. bills to: The Seed Guild, P.O. Box 8951, Lanark, Scotland ML119JH. Information can also be obtained from the Internet at <http://www.gardenweb.com/seedgd>.

### MAGNOLIA LIST

**T**he Magnolia Society, Inc., has published a revised *Check List of the Cultivated Magnolias*, a bibliographical listing of more than 1,000 magnolia cultivars with descriptions in a 97-page paperback book. Send \$15 plus postage (\$3.50 in the United States, \$5 in Canada, and \$7 elsewhere) to The Magnolia Society, Hazel Tarpley, Treasurer, 5637 S. Ryan Street, Seattle, WA 98178.

## classifieds

### a look at current offerings from the marketplace

**CLASSIFIED AD RATES:** All classified advertising must be prepaid. \$2 per word; minimum \$50 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 Department, 4350 DiPaolo Center/Dearlove Road, Glenview, IL 60025, or call (847) 699-1707.

### THE AVANT GARDENER

**DON'T MISS THE BEST!** Subscribe to America's liveliest gardening publication. Every month "the unique horticultural news service" brings you the latest on new plants, products, techniques, with sources, feature articles, special issues. 28th year. Curious? Sample copy \$2. Serious? \$14 full year (regularly \$20). **THE AVANT GARDENER**, Box 489M, New York, NY 10028.

### CACTI AND SUCCULENTS

**RARE AND EXOTIC PLANTS** from around the world. Catalog \$2, refundable. **ABBEY GARDEN CACTUS**, P.O. Box 2249, La Habra, CA 90632-2249, (310) 905-3520. FAX (310) 905-3522.

### GARDEN TOURS

**NEW ZEALAND GARDEN TOURS.** Spring gardens, October 1996. Summer gardens with TV host Jim Wilson, January 1997. Daffodil, iris, camellia garden tours. NZ garden specialists. **KIWIPAC TOURS**, 1919 Chula Vista Drive, Belmont, CA 94002. (415) 595-2090.

### GARDEN DESTINATIONS WITH ELLEN HENKE, Ph.D.

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### HOUSE PLANTS

**ORCHIDS, GESNERIADS, BEGONIAS, CACTI AND SUCCULENTS.** Visitors welcome. 1996-1997 catalog, \$2. **LAURAY OF SALISBURY**, 432 Undermountain Rd., Salisbury, CT 06068, (860) 435-2263.

### MAIL-ORDER SOURCES

**GARDENER'S SOURCE GUIDE**—New 1996 directory. 900 mail-order sources for home gardening—outdoors and indoors. 800 offer free catalogs. Hundreds that charge for their catalog will send it free to customers of the Guide. Only \$5.95. **GSG**, P.O. Box 206 AHS, Gowanda, NY 14070-0206.

### NURSERY FOR SALE

**FOR SALE**—Small specialty mail-order nursery in western North Carolina. Many amenities. Asking price: \$350,000. Some owner financing. Only serious inquiries please. Fax (704) 738-8131 or call (704) 738-8300.

### PLANTS (UNUSUAL)

**JOY CREEK NURSERY** perennials and native plants. Catalog \$2, refundable. **JOY CREEK NURSERY**, Bin 2, 20300 N.W. Watson Rd., Scappoose, OR 97056.

### PUBLICATIONS

**GARDENS & NATURE**—Bold, beautiful and wonder-filled gardens. Latest worldwide horticultural and landscaping techniques. **FREE SAMPLE.** Six issues \$12. **GARDENS & NATURE**, Box 394, Sound Beach, NY 11789.

**Hortica:** Color Cyclopaedia of Garden Flora with Hardiness Zones and Indoor Plants, 8,100 color photos by Dr. A. B. Graf, \$238.

**Tropica 4:** 7,000 color photos of plants and trees for warm environments, \$165.


**Exotic House Plants:** 1,200 photos, 150 in color, with keys to care, \$8.95.

Shipping additional. Circulars gladly sent.

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

### REAL ESTATE

Charming Venezuelan farm for sale. 4-plus acres. 3 houses, 2 greenhouses, city water, well, rainwater tanks, phone, electricity. 30 minutes from Caracas. Call (941) 366-0446.

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## pronunciations

### a simple speaking guide to plants found in this issue

*Abutilon pictum*  
uh-BYEW-tih-lon PIK-tum

*Aconitum carmichaelii*  
ak-o-NY-tum kar-my-KAL-ee-eye

*Adenostoma fasciculatum*  
ah-den-os-TOH-muh  
fas-sik-yew-LAY-tum

*Aloe marlothii*  
AL-o mar-LO-thee-eye

*Anchusa azurea*  
an-CHEW-suh as-YEW-ree-uh

*Aphelandra squarrosa*  
aff-eh-LAND-ruh squaw-RO-suh

*Artemisia caucasica*  
ar-teh-MEEZ-yuh  
kaw-KAZ-ih-kuh

*Atriplex californica*  
AT-rih-pleks kal-ih-FORN-ih-kuh

*A. lentiformis* subsp. *breweri*  
A. len-tih-FOR-mis  
subsp. BREW-ur-eye

*Baccharis pilularis*  
BAK-uh-riss pil-yew-LAIR-iss

*Barleria cristata*  
bar-LAIR-ee-uh kris-TAY-tuh

*Borago officinalis*  
bor-AY-go o-fiss-ih-NAL-iss

*Browallia speciosa*  
bro-WAL-lee-uh spee-sec-O-suh

*Brunnera macrophylla*  
bruh-NEH-ruh mak-ro-FIL-luh

*Buchloe dactyloides*  
boo-KLO-ee dak-til-OY-deez

*Bulbine frutescens* var. *incurva*  
BUL-byne froo-TES-enz  
var. in-KUR-vuh

*Camassia scilloides*  
kuh-MASS-ee-uh sil-OY-deez

*Carya illinoensis*  
KEH-ree-uh ill-ih-no-ih-NEN-sis

*Catharanthus roseus*  
kath-ur-AN-thuss ro-ZAY-us

*Centaurea cyanus*  
sen-TAH-ree-uh sigh-AN-us

*Cerastostigma plumbaginoides*  
sur-at-o-STIG-muh  
plum-baj-ih-NOY-deez

*Cerastium tomentosum*  
suh-RASS-tee-um  
toh-men-TOH-sum

*Chasmanthe aethiopica*  
chas-MAN-thee ee-thee-O-pih-kuh

*Chionodoxa grandiflora*  
ky-on-o-DOK-suh gran-dih-FLOR-uh

*Colocasia esculenta*  
kol-o-KAY-see-uh es-kyew-LEN-tuh

*Cotinus coggygria*  
KO-tin-us ko-JEE-gree-uh

*Cuphea hyssopifolia*  
KOO-fee-uh  
hiss-sop-ih-FO-lee-uh

*Cynoglossum nervosum*  
sin-o-GLOS-sum nur-VO-sum

*Delosperma cooperi*  
del-o-SPER-muh KOO-per-eye

*D. nubigenum*  
D. noo-BIJ-en-um

*Dracaena marginata*  
druh-SEE-nuh mar-jih-NAY-tuh

*Eschscholzia californica*  
es-SHOLTZ-zee-uh  
kal-ih-FORN-ih-kuh

*Evolvulus glomeratus*  
ee-VOL-vyew-lus glom-ur-AY-tus

*Felicia amelloides*  
feh-LEE-shuh am-el-LOY-deez

*Gazania rigens* var. *leucolaena*  
gah-ZAY-nee-uh RY-jenz  
var. loo-ko-LAY-nuh

*Graptophyllum pictum*  
grap-toh-FIL-lum PIK-tum

*Hedera canariensis*  
HED-er-uh kan-air-ee-EN-sis

*Houttuynia cordata*  
hoo-TYNE-yuh kor-DAH-tuh

*Ipomoea tricolor*  
ih-po-ME-uh TRY-kul-ur

*Koeleruteria bipinnata*  
kel-roo-TEER-ee-uh  
by-pin-NAY-tuh

*Lobelia erinus*  
low-BEEL-yuh AIR-ih-nus

*L. siphilitica*  
L. sih-fih-LIH-tih-kuh

*Manihot esculenta*  
MAN-ih-hot es-kew-LEN-tuh

*Mertensia virginica*  
mur-TEN-see-uh vir-JIN-ih-kuh

*Myosotis sylvatica*  
my-o-SO-tiss sil-VAT-ih-kuh

*Ophiopogon*  
o-fee-o-PO-gon

*Parthenocissus quinquefolia*  
par-theh-no-SISS-us  
kwin-kweh-FO-lee-uh

*Platycodon grandiflorus*  
plat-ih-KO-dun gran-dih-FLOR-us

*Plumbago auriculata*  
plum-BAY-go aw-rik-yew-LAY-tuh

*Prunus avium*  
PROO-nus AY-vee-um

*Quercus agrifolia*  
KWER-kus ag-rih-FO-lee-uh

*Rhoeo discolor*  
REE-oh DIS-kul-ur

*Sambucus nigra*  
sam-BOO-kus NY-gruh

*Santolina rosmarinifolia*  
san-toh-LEE-nuh  
roze-muh-rin-uh-FO-lee-uh

*Scilla siberica*  
SIL-luh sigh-BEER-ih-kuh

*Setcreasea purpurea*  
set-KREE-see-uh per-PER-ee-uh

*Strobilanthes dyeranus*  
stro-bi-LAN-theez die-ur-AN-us

*Tradescantia fluminensis*  
trad-es-KAN-tec-uh  
flu-mih-NEN-sis

*T. spathacea*  
T. spath-uh-SEE-uh

*T. zebrina*  
T. zeb-RY-nuh

*Ulmus americana*  
UL-mus uh-mair-ih-KAN-uh

*Umbellularia californica*  
um-bel-yew-LAIR-ee-uh  
kal-ih-FORN-ih-kuh

*Xanthosoma*  
zan-THO-so-muh

### What's in a Name: *Delosperma nubigenum*

Named by Nicholas Edward Brown (1849–1934), an authority on succulents who worked in the herbarium at Kew Gardens in Surrey, England, *Delosperma* is a genus of some 150 species of low-growing succulents in Aizoaceae, the carpetweed or fig-marigold family. Derived from the Greek roots *delos*, meaning “evident,” and *sperma*, meaning “seed,” the genus name refers to the way the seeds are exposed in the seed capsule. The species name, which loosely translates to “born among the clouds,” is a testament to the plant’s native habitat in the mountains of Lesotho and southern South Africa.



## No Ivy League

A group of volunteers dubbed the No Ivy League is reclaiming a Portland, Oregon, park from invading English ivy, which is destroying the habitat of native species. Forest Park, a self-contained urban forest, is a favorite recreation spot for city-dwellers seeking a natural retreat. But non-natives such as English ivy (*Hedera helix*) have moved in from neighboring landscapes and are causing a serious problem in approximately 10 percent of the park. Once the ivy takes over a section of land, it completely crowds out natives.

The Forest Park Ivy Removal Project was formed in 1993 to organize volunteers and educate the public about the importance of removing the ivy. Since then more than 1,000 volunteers have cleared ivy from 12 acres including 1,500 trees as well as hundreds of small isolated patches. Sandra Diedrich, coordinator of the program, explains that the ivy must be removed by hand since the steep terrain in the park prevents mechanical removal and spraying herbicides would kill the natives as well.

The group is currently evaluating both active restoration sites, where natives are replanted, and passive restoration sites, where nothing is planted after the ivy is removed. Both methods have succeeded in re-introducing natives to the park. The project has also provided training and advice to other ivy-removal groups getting started in the Portland area. For more information, contact Sandra Diedrich at (503) 823-3681

### Landscaping with Native Plants.

Western Carolina University, Cullowhee, North Carolina. (704) 227-7397.

### SOUTHWEST

**JULY 13 ■ Herb Questions?** Expert on hand. Desert Botanical Garden, Phoenix, Arizona. (602) 941-1225.

### JULY 25-26 ■ Greenhouse Tomatoes

**Seminar.** American Society for Horticultural Science. Sheraton Inn Denver Airport, Denver, Colorado. (703) 836-4606.

### AUG. 2-4 ■ Southwestern Low Desert Gardening and Landscaping

**Conference.** Wigwam Resort, Litchfield Park, Arizona. (602) 470-8086 ext. 824.

### WEST COAST

### JULY 6-7 ■ Cactus and Succulent

**Show and Sale.** The Huntington, San

Marino, California. (818) 405-2100.

### JULY 22-AUG. 4 ■ Sonoma County Fair and Exposition Flower Show.

Sonoma County Fairgrounds, Santa Rosa, California. (707) 545-4200.

### JULY 28 ■ Rock Planting Bonsai.

Lecture. Pacific Rim Bonsai Collection, Weyerhaeuser's Corporate Campus, Federal Way, Washington. (206) 924-3153.

**AUG. 31-SEPT. 2 ■ Fern and Exotic Plant Show and Sale.** Arboretum of Los Angeles County, Pasadena, California. (213) 258-9618 or (818) 441-3148.

### CANADA

### SEPT. 26-29 ■ Branching Out: Linking Communities Through Gardening.

American Community Gardening Association Conference. Montreal, Canada. In the U.S. (415) 285-7584 or in Canada (514) 872-6363.

## Before the Joneses Get One

Plant fanciers who patronize a new gift shop at Duke University's Sarah P. Duke Gardens in Durham, North Carolina, can purchase a rare selection of Japanese plum yew discovered in the gardens about 40 years ago and cultivated by university horticulturists. *Cephalotaxus harringtonia* 'Duke Gardens' is a slow-growing evergreen with numerous tufts of stiff, needlelike leaves. This dark green shrub will reach four to five feet tall and unlike its parent species has horizontal branches. It is especially prized for its ability to thrive in the South's summer heat.

Only 75 'Duke Gardens' plum yews were available for spring sales, but 100 more plants are expected to be ready this fall. Commercial nurseries are attempting to cultivate the Duke yew, but they are not likely to have it in quantity any time soon.

For more information, contact Sarah P. Duke Gardens at (919) 684-3698

## news briefs

### sources to expand your gardening world

#### NEW ANDERSEN SOURCE LIST

Finally, you can toss that tattered, dog-eared copy of the Andersen Horticultural Library's *Source List of Plants and Seeds* into the recycling bin. A revised and updated fourth edition of that indispensable guide to North American mail-order nurseries is hot off the printing press.

This comprehensive list of plants and seeds is a must for any gardener who orders plants through the mail. Nearly 60,000 plants and seeds are listed by botanical name, along with the mail-order and wholesale nurseries that carry them. Plants and seeds are also cross-referenced by common names for those cases when you know the plant you covet in your neighbor's garden only as "love-in-a-puff."

An improved coding system allows you to determine prospective plant sources by state. As in previous editions, addresses and telephone numbers for the 450 sources are included so you can call or write to get a catalog or price information. Order your new copy today or someone else may snap up the last *Magnolia* 'Marilyn' from Klehm Nursery in Champaign, Illinois.

The new edition is available for \$34.95, postpaid, from the Andersen Horticultural Library, Minnesota Landscape Arboretum, 3675 Arboretum Drive, P.O. Box 39, Chanhassen, MN 55317-0039. Make checks payable to the Andersen Horticultural Library.

#### GARDENER'S SOURCE GUIDE

It won't help you track down a particular species or cultivar in one shot, but it may introduce you to some previously unknown suppliers. *The Gardener's Source Guide* is a 33-page booklet listing 900 mail-order sources for different types of plants (ferns, butterfly plants, or hops, for instance) and supplies from artificial rocks to water treatment tanks, as well as horticultural organizations and magazines. In many instances, suppliers that normally charge for their catalog will send it free to users of the guide, says publisher Bob Armstrong. The guide is available for \$5.95 from: Gardener's Re-



# WHAT'S BUGGING YOU?



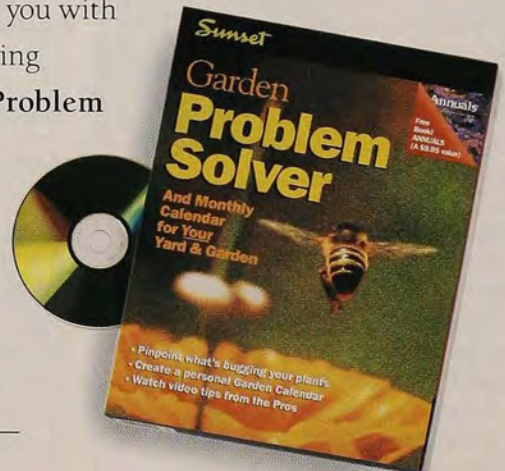
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