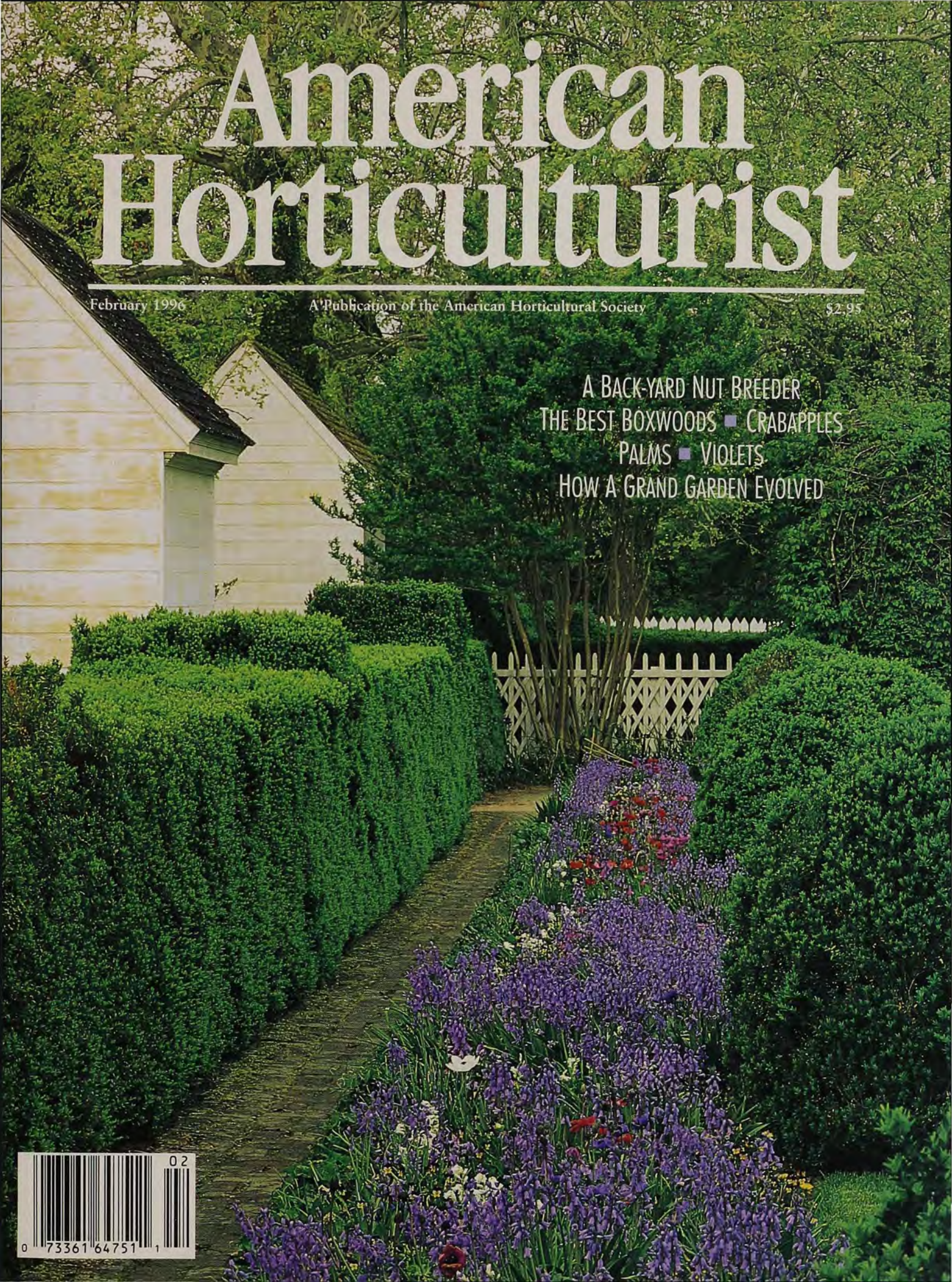
American Horticulturist

February 1996 A Publication of the American Horticultural Society $2.95

A BACK-YARD NUT BREEDER
THE BEST BOXWOODS ■ CRABAPPLES
PALMS ■ VIOLETS
HOW A GRAND GARDEN EVOLVED



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American Horticulturist

Volume 75, Number 2 February 1996

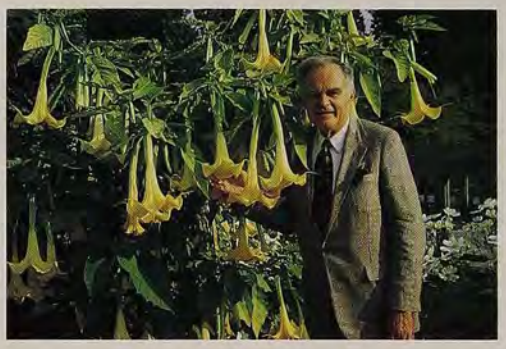
ARTICLES

DEPARTMENTS

FEBRUARY'S COVER
Photographed by Roger Foley

Slow growing, yet adaptable to a variety of shapes and forms, boxwoods have been favored landscape plants for centuries. Their versatility is displayed along this path at Colonial Williamsburg, Virginia, where the boxwoods on the left are clipped into a rectangular hedge. On the other side of the path—providing a backdrop to a bed of bright spring bulbs—is a line of boxwoods that retain a more natural rounded form. Read about proven performers among boxwoods beginning on page 24.

COMMENTARY



This is your last issue of *American Horticulturist*. In April the American Horticultural Society will be communicating with you in a new format: a totally redesigned magazine, *The American Gardener*—a 64-page color publication incorporating the features of this magazine and our alternating News Edition. In the future, we will be issuing *The American Gardener* every other month, plus our annual Seed Catalog in January and an Annual Report in the fall. Our focus will remain the same: to create a nation of gardeners who appreciate and understand the beauty, science, and environmental value of plants and gardens.

This issue is a good example of what we're all about. For the past eight years we have used our February magazine to feature "Proven Performers," inviting national and international plant societies to update you about exceptional plants to grow. This year we have an especially varied menu: boxwoods, written by Lynn R. Batdorf of the U.S. National Arboretum; crabapples, written by Dr. Thomas L. Green, head of Urban Forestry at Western Illinois University; palms, from Donald R. Hodel of the University of California Cooperative Extension Service; and sweet violets, from award-winning book author Tovah Martin. These articles should encourage you to increase the diversity of plants in your garden and your home.

We also profile some very different but equally passionate American gardeners. You'll learn how Richard Angino and his wife, Alice, who live outside Harrisburg, Pennsylvania, transformed an old farm to a modest residential landscape and then 40 acres of theme gardens in 25 years. In settings that are by turns Italian, French, or Japanese can be found thousands of rare cultivars, reflecting his appreciation of woody plants and her love of perennials. They are beginning to share the results of their hard work with others by opening their garden for tours.

You will also make the acquaintance of Cecil Farris, a retired tool-and-die maker in Lansing, Michigan. A Tennessee native, he began growing nut trees as a hobby in the '50s, working in his quarter-acre suburban back yard. Now he believes that his breeding work will give his adopted state commercially successful hardy hazelnuts, and perhaps walnuts as well.

We hope that all of you will pursue your own garden dreams. Every garden, no matter how large or small, whether it produces great beauty or bountiful food, makes our world a better place.

H. Marc Cathey, AHS President

P.S. Not only is our magazine changing with the times, but so is the way we serve you when you call our River Farm headquarters. We recently implemented a voice mail system to connect you directly to the staff member who can best meet your needs. Let us be your guide to gardening. Call (800) 777-7931 to discover the many services that AHS offers. You can reach me at extension 25.

MEMBERS' FORUM

Reluctant Predator

It was with great sympathy and empathy that I read of Boris Rubinstein's chipmunk invasion ("Member's Forum," November).

I have a concrete porch on one side of my house, and the little darlings burrowed in and under and round-about. Along came a hard rain, and water poured into my basement. I have been told of macadam driveways collapsing because chipmunks burrowed under to get from here to there. I firmly believe they were responsible for the nest in my car's air conditioner and the awful stench there last summer—not to mention the mechanic's charge for cleaning it out. I came to the reluctant conclusion that I had to be practical and hard-hearted.

This was once a rural county. Now the farms have been turned into two- and three-acre estates. Much of the natural woodland has been rearranged into parklands and play areas, thus interrupting Mother Nature's chain of survival. There is little evidence of the chipmunk's natural predators: Raptors are moving to more secluded habitat, and rodents multiply as rodents will. Sadly, I believe this puts us into the role of predator, in a limited way.

I've tried the usual methods. Urine and the like last until the next rain. One can never find *all* the entrances to their burrows. I believe they used the mothballs to play basketball. My only defense at this time is rat bait near my house in strategic places. I'm not sure I want to stop feeding the birds this winter, but all that lovely grain—the chipmunks love it!

Remind Mr. Rubinstein that as with all things in the garden, the watchword is patience.

Luella H. Brock
Churchville, Maryland

A Foxy Solution

In responding to Boris Rubinstein and others invaded by "critters," you mention fox urine. I used it this summer after all else had failed (Park Seed carries it) to keep squirrels from making off with all the pears before I got any. It worked! The smell is offensive to humans only while being applied and is not as bad as you might think—a lot less objectionable than mothballs, for example. But it certainly seems to send a message to smaller animals with more sensitive noses. The urine must be reapplied about every two weeks, but this is simple to do.

Now if I could find something that would get rid of the cats. They don't seem impressed with Brer Fox's supposed presence. Any suggestions?

Flower L. Hund
Warrensburg, Missouri

A Corny Mulch

Last summer I tried something different with my three-by-12-foot tulip/crocus bed, located in my lawn and surrounded by wood ties set halfway in the ground. Grass was encroaching under the ties, and weeds appeared as weeds do.

A light bark mulch allowed the crocuses and tulips to emerge—and the weeds and grass as well. A heavy mulch packed down and made the tulips and crocuses emerge with difficulty and late, although there were no grasses or weeds.

So I tried corncobs. Not regular cobs, but colorful, one-inch-diameter cobs from "grain corn" or "cow corn" harvested the previous year. They were cribbed and cleaned of their kernels and broken into three- to four-inch lengths. I covered the bed four cobs deep and spent the rest of the season grassless and weedless.

This spring when I noticed the crocuses and tulips emerging I thought I might need to remove a layer of the cobs, but it turned out to be unnecessary.

I believe the use of intact rather than ground-up cobs allows the plants to emerge more easily, as the cobs do not compact as much as other mulches. Their haphazard arrangement allows air and water to penetrate. Although they are not as colorful now as when they were first placed in the bed, they are not unsightly and are not noticeable from a distance.

My only problem has been some minor thievery from squirrels—but I have extra cobs.

Bruce Duncan
Kemptville, Ontario

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OFFSHOOTS

BILL FIRESTONE

Legacy

by Joan France

I used to live in a rented town house. When I moved in, the small patio area off the kitchen was completely overgrown. To the left were neighbors with a dog that not only barked every time I opened the door but left an unpleasant aroma drifting on the air. In short, my patio was uninviting at best, and my gardening was confined to an occasional swipe with a borrowed weedeater to control mosquitos.

Then one sunny May morning I took pity on my cat, Silver, usually confined to the house, and let him out to play among the weeds. During the winter, my neighbor's girlfriend had moved out and taken the dog with her. I sat on the back step, aimlessly watching Silver prowl around his pretend jungle.

Suddenly the screen door to the town house on the right opened, and a previously unnoticed new neighbor began to set out some elegant white porch furniture. He polished the glass table top until it gleamed and then raised an umbrella over it. I was ashamed that, after such an effort, all he had to look at was my weeds.

My thoughts drifted back to the previous summer. With my seven-year-old grandson in tow, I had returned from Lakewood, Colorado, to my native England to help my mother, who had suffered a series of strokes. When I wasn't by her side I took long walks through her neighborhood, where flowers in the tiny front gardens helped soothe away my sadness. I visited the fabulous azalea and rhododendron gardens at Leonardslee near my brother's home in Sussex, hushing my grandson into proper English garden tour etiquette. Hundreds of mature trees had been downed by a hurricane, and many still lay where they had fallen. Yet there was new life among them as baby rhodies crept out from under the rotting trunks.

These signs of renewal were a sharp contrast to the disorder in my mother's garden. My first sight of it marked the moment when I acknowledged to myself how very ill she was. A man still came to mow and

do some minor pruning, but the 'Queen Elizabeth' roses around the patio, which had been the source of such pride to her, were a tangle of overgrown canes and wild blackberry brambles. When I took the secateurs to them she showed no interest, and I soon gave up—as I could see that she had. It seemed typical of our relationship throughout my life that once again I had tried but failed to please her.

Emerging from my reverie on the step I began to wonder if I could turn my weedpatch into a Colorado version of those English front yards. The area's square shape was certainly about right. My biggest obstacle was psychological: I found it hard to be enthusiastic about creating a garden on land that I did not own. Then I recalled that the man who designed Leonardslee had been dead for more than a century. He couldn't have seen his plants completely matured and his vision fulfilled, yet he continued to speak clearly and joyfully to all of us who strolled through his creation.

So I set to work on my dreary plot, even though I had few tools and didn't feel that I could afford to buy any.

Suddenly, the extraordinary began happening, and everything slipped into place. Almost as soon as I recognized the need for something, it was supplied. One friend offered me a weedeater and a push mower to keep for the summer. Another loaned me her rake. Hanging baskets appeared out of the blue, and I discovered long-forgotten brackets for them in my basement. It seemed that everyone I met had chosen that year to divide their perennial plants, and they were glad to find a home for the extras.

A lack of tools and plants wasn't the only thing standing between me and my vision of those English front yards. This is, after all, Colorado. But the inspiration I needed was also right there waiting for me.

For several years I had been taking daily walks at Lakewood's Belmar Park, where I discovered an experimental xeriscape garden. I stopped once a month to see which plants were in bloom. These observations, coupled with visits to the Denver Botanic Garden, made clear that many xeriscape plants require a sunny location, and my north-facing plot was shaded for most of the day. Nevertheless, I decided to try some of those I liked best to see what would happen, relying on my shade to help lower evaporation and further cut water use.

Deciding that it was finally time for a financial investment, I bought a spade and hand tools, along with a soaker hose. At a local greenhouse, temptation appeared in the form of some large rhododendrons, but I knew enough about Colorado growing conditions to regretfully pass them by.

I did choose a few cowslips *(Primula veris)*, the primrose species that grows wild in English hedgerows. They would like my shade and contribute a touch of home. I bought alyssum and lobelia for my hanging baskets and planted four-o'clocks and moonflowers for fragrance. I needed only three pounds of grass seed to cover most of my bare ground, but battled back bindweed as the seed struggled toward becoming a lawn.

I wanted old-fashioned deck chairs and found them—I was no longer amazed by good fortune—on sale. Silver laid claim to the abandoned dog house on the property to our left, which was now frequently vacant, and spent his precious outdoor time stalking grasshoppers in his new pretend jungle there. My neighbor to the right never knew he had shamed me to action. I never saw him use his pretty outdoor furniture, and he soon moved away.

Three years later the unit on the left came up for sale. I bought it, gave away the dog house, and started on the weeds. I had learned a number of lessons. Instead of another lawn, I built a little brick terrace. I got rid of my hollyhocks and planted more iris, which thrive on neglect. Blue flax was replaced with mountain bluet *(Centaurea montana)*, a stunner at Belmar last spring. I gave up on moonflower and planted Virginia creeper instead. Dame's rocket *(Hesperis matronalis)* appears to like the shade. It grew to six feet this year and never became invasive, as it can in some gardens. When it blooms it reminds me of lilac. My trial-and-error approach has been interesting, if sometimes disappointing, but I notice that the gardeners at Belmar and the Denver Botanic Garden sometimes have to replace plants, too.

My relationship with my mother, as is so often the case, did not change prior to her death, which occurred a few months before I planted the first garden. It was quite some time before I realized that I had spent that summer building a memorial to her—a place where her spirit could visit and be at peace. Since I, too, found contentment there, we finally had something to share.

Today that garden, as gardens will, has changed, although my son still picks mint there. But the act of gardening continues to be my memorial to her, and the love of gardening, her legacy to me.

Joan France is a free-lance writer who operates a custom dessert business in Denver.

GARDENERS' INFORMATION SERVICE

Q: ***Is there a difference between American and English holly? My local nursery tells me there is no difference in their appearance.***

—A. K., Chesapeake, Virginia

A: English holly *(Ilex aquifolium)*, native to Europe and China, has traditionally been grown by nurseries on our West Coast, where it thrives in the moister climate, whereas American holly *(I. opaca)* is seen more in the East, where it is native from southern New England to northern Florida and westward to Missouri and Texas. Although both species will reach 30 to 50 feet at maturity under ideal conditions, Gene Eisenbeiss, a horticulturist at the U.S. National Arboretum in Washington, D.C., says, "The critical difference between the species is that *I. opaca* grows much larger than *I. aquifolium*, which is really a large shrub everywhere but in the Pacific Northwest. On the East Coast it is rare to see English holly reach more than 15 to 20 feet at maturity."

English holly has glossier leaves and slightly larger and more attractive fruits than does American holly. Another important difference is that American holly flowers and produces fruit on the current season's growth, while English holly's flowers are borne on old wood. According to Eisenbeiss, English holly also blooms a little earlier in the season than American holly, usually in late April at the National Arboretum compared with mid- to late May for American holly.

Eisenbeiss adds that English holly generally does not perform well south of USDA Zone 7a, so an American holly may be a better choice in your area. Selecting one of the many cultivars on the market—there are some 1,000 named selections of the American holly and about 200 cultivars of English holly, although not all are readily available in the trade—will give you more choice in terms of faster growth, cold and drought tolerance, and even variegated foliage and yellow berries. In his *Manual of Woody Landscape Plants*, author Michael Dirr says American holly is regionally adapted, so it would be helpful to poll local nurseries to find out which selections are best for your area. The National Arboretum has produced a listing called *The International Checklist of Cultivated Ilex, Part One: Ilex opaca.* To receive a free copy, write to Eisenbeiss at the U.S. National Arboretum, 3501 New York Avenue, NE, Washington, DC 20002.

Q: ***I have access to a lot of sawdust, which I would like to use as a mulch. But I've been told that sawdust can injure plants. Is that true? —E. H., Austin, Texas***

A: Sawdust has good insulation properties and can be a good mulch or soil amendment, although it might be easily blown around by your strong Texas winds.

Assuming that your sawdust is not derived from wood that could be contaminated with lead paint or rot-preventing toxins, you should be aware of two things before using it.

First, sawdust can create a nitrogen deficiency in the soil underneath it. Soil microorganisms need both carbon and nitrogen for the decomposition process. If a mulch or amendment is too heavily tilted toward carbon—as it is with wood chips, straw, or sawdust—the microorganisms will obtain nitrogen from the surrounding soil, thus making less nitrogen available to plants growing in it. Such a deficiency, however, can be prevented or cured by feeding the area with a high-nitrogen fertilizer. A non-chemical approach would be to mix the sawdust with a nitrogen source, such as grass clippings, or to let it compost first.

Second, if you decide to compost your sawdust, be sure to stir or aerate it periodically. If a big heap of any organic mulch becomes soggy and compressed, it can become anaerobic and highly acidic. If this happens, it will give you ample warning with a sour, ammonia smell.

Q: ***I have been hearing a lot about buckeye trees and would like to learn more about them. Is it true that they are native to my area? How would I start a new tree if I found one growing in the wild? And was the buckeye ever used for medicinal purposes? —D. I., Collinsville, Illinois***

A: There are a number of wonderful plants called buckeye. All of them belong to the genus *Aesculus*, in the horse chestnut family. You are probably referring to the Ohio buckeye *(A. glabra)*, which has a native range from western Pennsylvania to Nebraska and south to Alabama. If you can beat the squirrels to them, you can grow buckeyes from the nuts they produce, which are encased in slightly prickly shells. These nut–seeds do not retain their viability for any length of time, so plant them as soon as they fall off the tree. Because they need to be subjected to a period of cold to break dormancy, plant the nuts two inches deep outdoors in fall and cover with wire mesh to protect them from rodents.

All parts of the buckeye should be considered toxic, according to Nancy J. Turner and Adam F. Szczawinski, authors of *Common Poisonous Plants and Mushrooms of North America*. The Peterson Field Guide *Eastern/Central Medicinal Plants* says a minute dose of the powdered nut was once used to treat spasmodic coughs, asthma, and intestinal irritations, and an ointment made from the nuts was applied externally for rheumatism and piles. Native Americans are reputed to have put ground nuts in streams to stun fish. When other sources of food weren't available, they sometimes ate the nuts, reducing the toxicity through an elaborate leaching process. *—Neil Pelletier, Director Gardeners' Information Service*

THE URBAN GARDENER

Growing Herbs with Hydroponics

by Kevin Skaggs

You love using fresh herbs for cooking, but you live in an apartment or a condominium and you don't have any garden space. Or maybe you have a small garden plot, but you don't have a greenhouse for growing those tasty herbs in winter. You could go to the grocery store every couple of weeks and buy two-ounce packets of fresh herbs for $1.99 a crack, or you could invest in a small hydroponic system that can fit in a hallway, laundry room, or patio and have the satisfaction of growing your own herbs year-round.

Hydroponics is the science and art of growing plants by allowing their roots to feed on a nutrient-rich solution rather than in soil. In most basic systems the plants' roots are supported by an inert, porous growing medium that absorbs the nutrient solution and helps aerate the roots. Numerous vegetable and herb growers around the country have been growing plants with hydroponics for years. In fact, it's quite likely that the herbs in those expensive little supermarket packets are grown hydroponically. Although the advent of modern hydroponics dates back to the 1930s, recent advances in technology have been spurred by research associated with international space programs and with the need to grow food in regions such as deserts where soil or water—or both—are in short supply.

According to hydroponic system distributors, hobbyists and "closet" gardeners are fueling a demand for small, portable systems. The benefits? A hydroponic system can produce more per square foot than a soil garden. According to Brooke Taggart, co-owner of Plant'It Earth in San Francisco, "A two-foot rosemary bush can grow in a half-gallon hydroponic solution as compared to two gallons of soil medium." Herbs also grow up to 25 percent faster in a hydroponic solution than they do in soil because they don't have to work as hard to develop or survive. Supplied with a correctly balanced nutrient solution, plants receive all they need for healthy growth without having to send out roots in all directions or wait for nutrients to break down. And because the herbs don't need to develop an extensive root system they can put more of their energy into growing foliage.

COURTESY OF GENERAL HYDROPONICS

Basil is one of the most rewarding herbs to grow in a hydroponic system.

Hydroponic herbs are also extremely flavorful and nutritious, say devotees, which has made them popular with chefs at gourmet restaurants around the country. Lawrence Brooke, owner of General Hydroponics in Sebastopol, California, says an independent laboratory last year tested hydroponic crops against the same plants grown in soil under controlled conditions and "found a threefold increase in vitamins and minerals in the hydroponically grown crops."

All kinds of herbs can be grown in a hydroponic garden. Brooke says basil grows particularly well in hydroponic systems, closely followed by chives, cilantro, parsley, tarragon, and a variety of mints. Most experts suggest first-time hydroponics users start off with a fairly easy crop such as basil, which matures quickly and has few requirements.

Just as you would when planting herbs in soil, it's important to keep in mind the growing requirements of each type of herb when growing them hydroponically. Basil requires a more concentrated nutrient solution than do Mediterranean herbs such as thyme and oregano, which develop better aroma and flavor when grown in a less nutrient-rich medium. Appropriate growing temperatures also vary from herb to herb. Basil and parsley prefer warmer temperatures than do herbs such as dill and rosemary.

As with most hobbies, there are a wide range of hydroponic kits available to fit different needs and different budgets. Probably the most crucial difference between various hydroponic systems is the method by which the nutrient solution reaches the roots. One of the simplest methods uses a wick to draw nutrients from a reservoir to the growing medium. Brooke says this type of "passive" system's main drawback is that it is oxygen deficient. The next step up is a "flood-and-drain" system that uses a pump and timer to flood the growing medium at set intervals. Excess nutrient solution flows back into a reservoir. A third type, recommended by Brooke, is a "constant-feed" system where the nutrient solution is steadily pumped to drip through the aggregate and then drain back into a reservoir. In a newer system, the "nutrient film technique," PVC tubes carry a steady stream of nutrients to individual plants whose roots are surrounded by plastic film.

A very basic constant-feed system can cost as little as $50 for two-and-a-half square feet of growing area. You can start with a basic kit and buy accessories as you need them.

Another choice first-time hydroponics users face is what growing medium or aggregate to use. Traditionally the choice has been among rounded half-inch-diameter fired clay pebbles known as "light-weight aggregate" or "gro-rocks," a lavalike sub-

stance called "rock wool" that is made from molten rock spun into cotton candy-like fibers, and perlite. Brooke says grorocks are "the best choice because they are very friendly and forgiving and give consistent results." He warns, however, that some companies are selling light-weight aggregate that is strongly alkaline and can alter the pH of the nutrient solution.

Light is of course a crucial element in hydroponics. Michael Christian, president of Arcata, California-based American Hydroponics, says sunlight is the best and cheapest form of lighting, but notes that you need "at least six hours of direct sunlight a day for a thriving garden." If that's not an option, Christian recommends investing in a 250- or 400-watt high-intensity discharge (HID) lighting system. Fluorescent lighting is less expensive, but HID lights provide the greater range of light wavelengths that most plants need for optimal growth.

Although growing plants hydroponically offers many benefits in comparison to growing in soil, the nature of the nutrient-supply system means there is less room for error. Without the benefit of soil's buffering qualities, mistakes can be serious, so careful attention must be paid to the concentration and pH balance of the nutrient solution, especially during the first week of growth.

After that, as with gardening in soil, the key to hydroponics is monitoring and observing your plants. Once you understand the dynamics of soilless gardening it is easy to keep your herbs happy—as well as vegetables and flowers—and ensure yourself a fresh supply throughout the year.

A free-lance writer attending graduate school in New York City, Kevin Skaggs writes frequently on gardening topics.

SOURCES

American Hydroponics, 286 South G Street, Arcata, CA 95521-6621, (800) 458-6543.

General Hydroponics, P.O Box 1576, Sebastopol, CA 95473, (800) 374-9376.

Hollisters Hydroponics, P.O. Box 16601, Irvine, CA 92713, (714) 551-3822.

Hydrofarm East, 208 Route 13, Bristol, PA 19007, (800) 227-4567.

Ohio Indoor Gardening, 4967 North High Street, Columbus, OH 43214, (800) 833-6868.

Plant'It Earth, 2215 Market Street, San Francisco, CA 94114, (415) 626-5082.

Texas Growers Supply, 5990 North Sam Houston Parkway East, Suite 602, Humble, TX 77396, (800) 861-7731.

PLANTING THE FUTURE

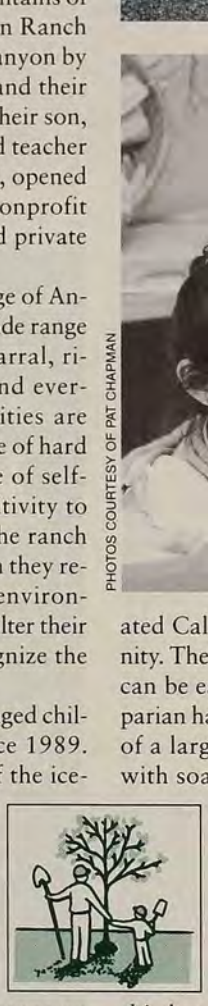
A Ranch Retreat

A common problem for urban children across the country is the lack of contact with the natural environment, but a remarkable school in California is working to change that. Teachers at the Chapman Ranch School not only share the beauty of their mountain retreat, but they also show schools how to bring nature back into the classroom.

Located in the San Gabriel Mountains of Southern California, the Chapman Ranch was established in San Antonio Canyon by Clarence and Eleanor Chapman and their family in the late 1920s. In 1989 their son, Robert, and his wife, Pat, a retired teacher from nearby Mount Baldy School, opened the Chapman Ranch School, a nonprofit educational facility for public and private school children.

The 40-acre property on the edge of Angeles National Forest contains a wide range of environments including chaparral, riparian, pond, oak woodland, and evergreen forest. The school's activities are oriented toward teaching the value of hard work, enhancing students' sense of self-worth, and increasing their sensitivity to the cycles of nature. Visitors to the ranch school get ideas they can use when they return to their own educational environments, and teachers are helped to alter their urban school sites to better recognize the importance of the natural world.

More than 20,000 elementary-aged children have visited the school since 1989. But the field trip is just the tip of the iceberg. Ideally, each school works with the ranch for a three-year period to develop a curriculum that will use the natural environment to teach the arts and sciences. The first year includes in-service programs for teachers, pre- and post-visit classroom lessons on understanding nature's processes, and, of course, the visits to the ranch.



Teaching tools at the ranch include vegetable gardens, farm animals, a pond, wildlife, hiking trails, beehives and a re-created California Native American community. Then there are the special gardens that can be easily copied at a school site. A riparian habitat garden, for instance, consists of a large rotting log placed in the shade with soaker hoses on it. A small, plastic-lined depression under the log becomes a pond with native shade plants and trees growing out of the log and around the pond.

In the second year, the aim is school-site development of a pond and native garden. By the third year, teachers and their classes are ready to start community gardens in their own neighborhoods.

"The intent is to further connect children with the natural cycles occurring around them and to give them a sense of place on the earth," says Pat Chapman.

While most of the students who visit the ranch are in elementary school, a few high school students have been coming to the ranch for the past five years to work. They do jobs around the ranch such as picking apples, raking and hauling leaves for compost, and maintaining walking trails. But their most challenging role is helping to guide the younger children through the program.

"They get a different picture of themselves because when you teach, you learn," Chapman points out. "They become role models for younger children. Some of these high school students have even developed their own programs at their school site, where they provide instruction for successful worm bins and build and market 'carry-out gardens' for classroom

The carry-out garden, left, lets schools have gardens in winter, and even if they lack outdoor space. In the Chapman Ranch School barn, children have a personal encounter with earthworms, below.

PHOTOS COURTESY OF PAT CHAPMAN

teachers." (See sidebar, this page.)

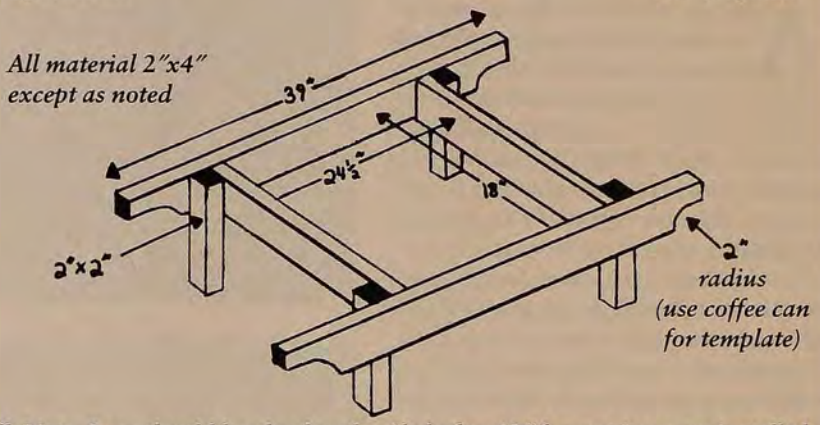
Financing the ranch has been another feat of creativity. Each field trip of two classes, or about 65 children, costs the school $700. However, most of the trips are financed by ranch scholarships. The ranch pays half the trip fee for schools with more than 50 percent minority enrollment and those with schoolwide test scores ranking below the 50th percentile. That doesn't leave much to pay the ranch's six staff members and general costs of operation, so they depend heavily on contributions.

Says Chapman: "We like to think we get our creativeness from our 'group mind' and we do depend on people much more than we depend on paper. The latter has made it difficult for us to obtain funding, but we believe that a child excited about learning in a natural environment is much more impressive and lasting than 10 pages of written words."

She continues: "If we had a wish, it would be that a place such as the Chapman Ranch School could be re-created in the middle of a city for any group of children and teachers that wanted such a place, to stretch their imaginations and to learn from the natural world." —*Nikole Williamson*
Editorial Assistant

CARRY-OUT GARDENS

For teachers who find the thought of growing *anything* overwhelming, the Chapman Ranch School developed "carry-out gardens." The planting box is a 20-by-32-inch plastic container, usually used for mixing concrete, with holes drilled in the bottom for drainage. Supporting the box is a wooden frame with sides extending five inches past the box for carrying handles. Four wooden legs raise the garden off the ground. Children can transport this garden outdoors during the day and bring it back inside at the end of the school day. Keeping the garden in the sun emphasizes the importance of the sun and the earth's relationship to it. The garden will need soil, and many teachers use this opportunity to introduce the class to worm boxes, the castings of which become the mini-garden's growing medium. —*Pat Chapman*



10" tall. Note: Legs should be glued and nailed after 18" frame pieces are installed.

NATURAL CONNECTIONS

Hornet Bite is Bad for Bark

Introduced to the United States from Europe between 1840 and 1860, the European hornet *(Vespa crabro)* has an unfortunate predilection for stripping bark from ornamental trees and shrubs in late summer or early fall. Most early references concluded that the hornets were stripping bark to mix with saliva and form a papery material used for nest building. But subsequent observations by horticulturists and entomologists indicate the hornets are actually indulging in some kind of insect "feeding frenzy"—chewing up the bark and then lapping up the fluid or sap secreted between the inner bark (cambium) and phloem sections of tree limbs.

COURTESY OF SUZANNE W.T. BATRA, USDA

An odd habit of stripping bark from trees and shrubs has drawn attention to European hornets.

Suzanne W.T. Batra, a research entomologist with the U.S. Department of Agriculture's bee research laboratory in Beltsville, Maryland, says that in addition to feeding on sap exposed by stripping bark, the hornets capture bees and other hornets attracted to the sap. She has also observed the hornets ingesting the fermented sap that forms as "slime fluxes" on oak trees in late summer. "They literally fall down drunk and can be seen wobbling on the ground," says Batra.

Frank Santamour, a research geneticist at the U.S. National Arboretum, and Albert Greene, now with the U.S. General Services Administration—both in Washington, D.C.—observed hornets stripping bark on green ash trees *(Fraxinus pennsylvanica)* at the National Arboretum's test planting site in Beltsville in the mid-1980s. They were intrigued enough to write an article on the hornets, published in the November 1986 edition of the *Journal of Arboriculture*. "We were checking which of the ash trees in our planting had seeds when we noticed 20 to 30 hornets clustered in one tree, all happily chewing and lapping away," says Santamour. When the researchers returned later to assess the damage, they found that about 130 out of 500 ash trees exhibited bark stripping.

One of the most interesting things Santamour and Greene noticed was that plants that originated in more northerly locations were less likely to be damaged than plants from southerly areas. They concluded that plants with southern provenances had an extended period of cambial activity and "bark peelability" compared with plants of the same species from farther north.

"What really piqued my curiosity was: Why are these hornets so attracted to something that does not appear to be terribly nutritious? Considering how long it takes to remove the bark, that's an awful lot of wasp-hours spent on this activity," says Santamour. Seeking a chemical responsible for attracting the hornets, last year Santamour managed to isolate com-

pounds from the juicy inner bark of ash, birch, and lilac that appeared similar in chemical tests. He had high hopes of being able to attract hornets away from lilac by offering them a sample of the extract. But when it came to a trial last fall, the experiment failed miserably. To Santamour's chagrin, the hornets paid no attention to his extract.

In addition to the plants on which Santamour has observed the hornets, other references make mention of damage to poplar, willow, boxwood, fringe tree, rhododendron, and even dahlia. In *Insects That Feed on Trees and Shrubs,* authors Warren T. Johnson and Howard H. Lyon note that the damage is often blamed on squirrels. Although the bark stripping does not pose a mortal threat to the target plants, often enough bark is removed to girdle the branch and cause the tip to die. Santamour points out that severe attacks could result in crown damage or the loss of a leader in a prized ornamental specimen. The exposed wood could also serve as an entry point for borers and disease.

Distributed along the Eastern Seaboard from New England to northern Georgia and westward to Tennessee, Michigan, and southern Ontario, European hornets are the largest hornet species found in the United States. Santamour describes them as appearing similar to "a pumped-up yellow jacket." Jay Nixon, vice president of American Pest Management in Takoma Park, Maryland, says the hornets are "closest in size to the cicada-killer wasp. They are big and scary looking, but you've got to really rile them up to get them to sting you." He adds, from painful personal experience, "However, you don't want to try." The hornets prefer to nest in hollow trees or sheltered nooks in homes, where their fragile, papery nests are protected from harsh weather. Nixon says he has removed many of the tan-colored nests from attics and from beneath eaves.

Nixon also has had personal experience with the hornets' bark-stripping behavior and agrees that it is not linked to nest building. But he adds that there is little a homeowner or nursery owner can do about the damage. "By the time you notice the girdling, the damage is already done."

Santamour is quick to acknowledge that this botanical oddity is not one of the more pressing issues in horticulture, but feels that nursery owners and gardeners should be "aware of and recognize the injuries caused by this insect. They are very active, whether or not people ever see it."

—David J. Ellis
Assistant Editor

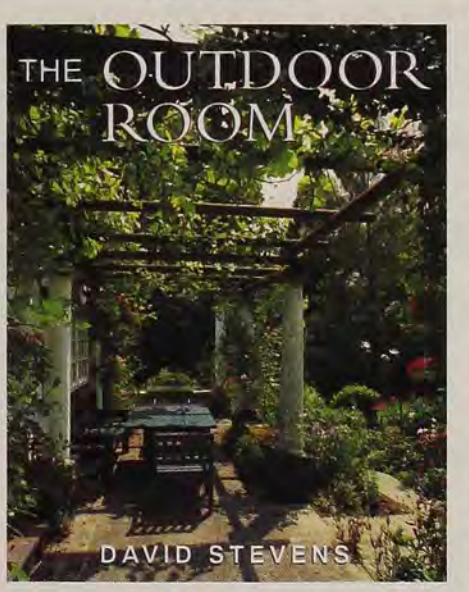
BOOK REVIEWS

The Inward Garden

Julie Moir Messervy. Little, Brown and Company, Boston, Massachusetts, 1995. 256 pages. 10″ × 10″. Color photographs by Sam Abell. Publisher's price: hardcover, $35. AHS member price: $32.50.

The Outdoor Room

David Stevens. Random House, New York, New York, 1994. 192 pages. 8 3/4″ × 11″. Color photographs and black-and-white diagrams. Publisher's price: hardcover, $40. AHS member price: $36.



Two outstanding books with opposite-sounding titles take you on separate journeys to the same destination: a meaningful and functional landscape. Julie Moir Messervy's *The Inward Garden* offers a refreshingly new perspective on one of the core reasons behind creating a garden. Messervy has done a marvelous job of leading the reader on a journey of inner discovery. Through very logical and linear steps, she brings you to an understanding of a very nonlinear concept. It is a very spiritual, yet nonetheless practical book on the art of using spaces to touch your innermost psyche. Messervy has an innate understanding of how various design elements and objects affect the dynamics of a space. She draws strongly on lessons she has learned in Japan and provides some insight for the reader into why the Japanese garden is the peaceful enclave that we recognize it to be. The beautiful photographs by *National Geographic* photographer Sam Abell are extremely sensitive to the context of Messervy's writing, and they serve as the perfect complement to her message.

In David Stevens' *The Outdoor Room* I found a thoughtful book on the creation of beautiful and functional outdoor living spaces. While Messervy's book is rich with metaphors, Stevens has chosen to use the single metaphor of a room in defining the garden. His observations regarding the impact of architecture on our yards and gardens are exemplary. A garden is not so much a random collection of different elements as it is defined by the thoughtful placement of those elements. His consistent application of the room metaphor allows his readers to come to an easy understanding of how numerous garden elements might be applied in their own personal spaces.

In the latter part of the book is an excellent section on "Well-Designed Gardens" that provides insight into the creative use of space. I also found the portion of the book on maintenance helpful. Although an entire book could be dedicated to this important aspect of gardens, this section helps guide readers with some direction on where they should go for assistance.

In the end, whether you look inward or outward, both books admirably serve the purpose of showing how to create a beautiful and functional aesthetic environment.

—Richard L. Dubé

Richard L. Dubé operates a landscape design firm, Environmental Information & Design, based in Buxton, Maine.

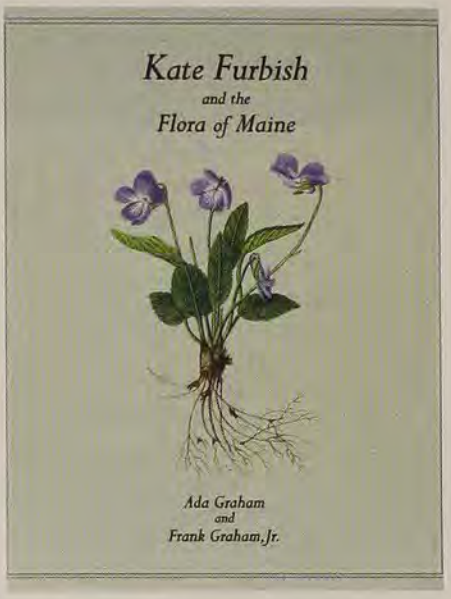
Kate Furbish and the Flora of Maine

Ada Graham and Frank Graham Jr. Tilbury House, Publishers, Gardiner, Maine, 1995. 162 pages. 8″ × 10″. Color and black-and-white illustrations. Publisher's price: softcover, $30. AHS member price: $27.

A blend of biography, history, and botany, *Kate Furbish and the Flora of Maine* paints an engaging portrait of the botanist–artist who influenced a generation of amateurs and professionals through her boundless enthusiasm, keen observation skills, and undaunted field work.

Furbish's life and times are revealed through her correspondence, journals, and lectures, as well as through the writings of her friends and colleagues. Born in 1834, Furbish was an intelligent, adventurous woman passionately dedicated to botany. She shared with her Victorian counterparts a sense of duty to family and religion, but overcame the restrictions of that era through a dogged pursuit of her life's work, which was no less an accomplishment than recording *all* the known flora of Maine for contemporary and future botanists.

Furbish refused to play by the rules—bypassing marriage, ignoring increasingly severe pain that might have sidelined a less determined person, and persevering despite the restrictions placed on women. For instance, women were barred from membership in the New England Botanical Club until the 1960s, yet Furbish faithfully read its journal, *Rhodora,* to keep up with the accomplishments of academic botanists, especially Merritt Lyndon Fernald, a friend



and colleague 40 years her junior.

Her status as an unmarried woman with a large extended family afforded her a degree of mobility seldom matched today. She traveled extensively from her home in Brunswick, Maine, to visit family and friends throughout the eastern United States—even taking a trip to Europe and living in Paris for several months. Most important, during a 40-year period, she meticulously botanized throughout Maine, traveling into remote, rugged areas to form as complete a picture as possible of her native state's flora.

Although an amateur (she held one paying position, as botanist at the Poland Spring House resort, when she was nearly 60), she established lifelong friendships with and earned the respect of many in the field, such as Fernald—one of the preeminent figures in American botany. She was also a founding member of the Josselyn Botanical Society of Maine.

Her contribution to botany survives in the 14 volumes of 1,326 watercolors called the Flora of Maine that she donated to Bowdoin College and through some 4,000 plant specimens at Harvard's Gray Herbarium. Two plants bear her name. In the 1970s Furbish's lousewort gained national attention for its role in halting plans for a hydroelectric power plant in Maine.

Furbish always maintained that her illustrations were for scientific purposes and not ornamentation, yet her sketches and watercolors betray an artistic sensibility. The color illustrations in the book are often breathtaking and evoke the artist's affection for the character of individual plants. Unfortunately, the black-and-white reproductions of some of Furbish's illustrations lack the minute detail painstakingly included by the botanist, suffering

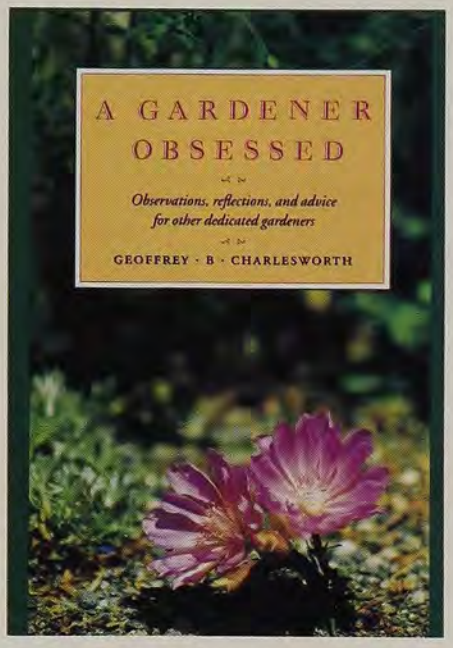
from a tendency to become muddy with the lighter parts nearly fading altogether.

There are also a distracting number of typographical errors and occasionally a missing narrative transition. But the design of the book is refreshingly different, and the majority of the illustrations evoke the beauty and elegance of even the humblest plants, such as cattails and dandelions. In addition, the captions accompanying the illustrations offer tidbits of information not included in the text—such as plant name origins, folklore, and habitat.

All in all, the book leaves me wanting to take a trip to Bowdoin College to see firsthand the lyrical watercolors of this remarkable woman. The Grahams' book will do much to ensure Kate Furbish's rightful place in the history of American botany.

—Terri J. Huck

Terri J. Huck is assistant editor of American Horticulturist.



A Gardener Obsessed

Geoffrey B. Charlesworth. David R. Godine, Publisher, Inc., Boston, Massachusetts, 1994. 244 pages. 6″ × 9¼″. Color photographs. Publisher's price: hardcover, $24.95. AHS member price: $22.45.

I particularly like the clarity of subject expressed by this book's subtitle: *Observations, Reflections, and Advice for Other Dedicated Gardeners.* It is an objective that is amply fulfilled. I thoroughly enjoyed reading this book, even though the author's Massachusetts garden and many of the plants he so fondly describes are certainly well outside the realm of possibilities and probabilities in my Southern California garden. Without exception, Charlesworth's essays are right on target and are readily accessible and applicable to any good gardener.

To me, the most important features of any horticultural book are that the information is sound and well written, and the ideas clearly presented. At the highest level, a book's ideas should either replace old assumptions or express thoughts, observations, and ideas that the reader had always sensed but been unable to articulate. Along those lines, *A Gardener Obsessed* can be highly recommended.

The book is divided into four sections, the first of which is a collection of essays on rock gardens, rock gardeners, and growing plants from seed. A number of my favorite essays are in the second section, titled "Ideas About Gardening," which covers an extensive range of topics, among them the author's definition of a garden, his personal plant goals, and his thoughts on garden paths, keeping records and lists, patience, and gardening in old age.

The third section, "Growing Plants," includes three stunning essays on succulents, gentians, and composites, as well as a chapter that lists 100 rock garden plants Charlesworth says he would recommend to "a friend who was just starting out and wanted advice to follow or ignore." The list contains quotes from a variety of nursery catalogs, coupled with the author's opinions of, and experiences with, each plant. This is an unusual and effective method for conveying the regional differences between gardens and gardeners. Lastly, the brightly written fourth section places seasons and days within the context of a garden and gardening.

In his essay "Gardening in Old Age," Charlesworth writes that on his 70th birthday he made a list of gardening resolutions—cutting back on the number of beds in the garden, sowing 200 fewer pots of seeds each year, and other similar acknowledgments of age. Luckily these grim thoughts are met with this uplifting postscript: "That year I made eight new beds. For the next three years I sowed even more packets of seed." Such is the life and experience of a gardener obsessed—we can only hope that it may include at least a third book to go along with this one and his first effort, *The Opinionated Gardener.*

—Bart O'Brien

An avid rock gardener and author of a number of articles and books on the subject, Bart O'Brien is director of horticulture at Rancho Santa Ana Botanic Garden in Claremont, California.

GALEN GATES

Crabapples

When you're choosing one of these apple cousins, make flowers your last consideration.

BY THOMAS L. GREEN

If, as 18th-century English poet William Cowper wrote, "variety's the very spice of life," then the crabapple is the spice of the landscape. No other full-sun, ornamental tree offers so much versatility in habit, size, flowers, and fruit. Variety, however, can also make choice more difficult. There are more than 900 named crabapple cultivars, approximately 200 of them available from nursery sources.

The flowering crabapple is also versatile in the conditions in which it will flourish. As a result, it is one of North America's most widely planted ornamental trees, from southern Canada to all but the extreme southern United States. Many cultivars are hardy to USDA Zone 2, and most have no trouble coping with the hot, dry summers common in the Midwest and West. Its range is limited only by excessive soil moisture and by the South's hot humid summers and too-brief winters.

Crabapples and apples are essentially the same—all members of the *Malus* genus. The only difference is in the size of their fruit. A crabapple has fruit less than two inches in diameter; a tree with larger fruit is an apple. While the crabapple is grown primarily as an ornamental, there are some crabapple cultivars with larger fruits (one to two inches) that are very good for eating and jelly.

But crabapples have developed a rather negative reputation. Some of the cultivars introduced to the trade in the 1940s and '50s were selected solely because of their floral display, without consideration of disease resistance, fruit display, or fruit retention. Their springtime ornamental qualities made them very popular in the nursery trade, but homeowners soon learned that these beautiful flowers came at a price. Messy fruit is the number-one complaint, followed closely by premature leaf drop caused by apple scab and other leaf diseases. In time some Cooperative Extension publications were even condemning all crabapples because of the bad habits of a few.

Unfortunately, some nurserymen are still selecting crabapples based only on their floral characteristics, and so are consumers. Many undesirable cultivars—'Hopa', 'Radiant', 'Flame', 'Eleyi'—are still widely sold. Flowers should be the last consideration for those who want to avoid getting an inferior cultivar. More important are disease resistance, colorful and persistent fruit, and a size and shape right for your landscape.

There are four major diseases of crabapples, three of them caused by fungi. Apple scab

While most pink- or red-flowering crabapples are highly susceptible to scab, 'Adams' is more disease resistant than most.

WITH *MALUS*, THE RULE IS FORETHOUGHT

If you choose quality crabapples, you should rarely have to worry about preventing or treating disease. But since many now in the trade are susceptible to one or more diseases, you should know something about these ailments. You may also need to do some occasional pruning.

Fire blight, caused by the bacteria *Erwinia amylovora*, is the most serious disease because it can kill a tree. It is commonly transmitted by insects, usually bees, but can also be transmitted by wind, rain, and pruning tools. Bactericidal chemicals are required for control, and removal of infected parts is also necessary. Fire blight is much more serious in certain regions, such as the Rocky Mountains.

Scab is caused by the fungus *Venturia inaequalis*. When spring and early summer are wet, it will cause defoliation in July and August, leaving a rather ugly and barren tree. Scab can be prevented with fungicide sprays. Because the fungus attacks still-opening leaves and crabapples develop new leaves well into summer, several applications are required.

Cedar-apple rust, caused by the fungus *Gymnosporangium juniperi-virginianae*, attacks leaves and fruit of susceptible cultivars. Heavily infected leaves will defoliate prematurely. This disease is much more common on the crabapple species native to the eastern United States *(Malus coronaria, M. ioensis)* and their hybrids. Choose resistant cultivars, rather than trying to control the disease with fungicides.

Powdery mildew, caused by the fungus *Podosphaera leucotricha*, attacks leaves, flowers, and fruit of susceptible cultivars but rarely causes serious injury.

While a branch that is dead, dying, or broken can be removed any time, late winter (February or March) is the best time to cut back crossing, rubbing, overlapping branches and to remove branches to develop the tree's form. Never prune more than 25 percent of the total top. This could stimulate an abundance of nonflowering vertical shoots and open the trunk to sunscald and attack by insect borers. And avoid over-pruning older trees; spread the removal of unwanted branches over a period of two years or more.

Suckers are sprouts that come from the roots or the rootstock, below the junction where the bud was grafted. This understock is almost always a non-ornamental cultivar. These suckers can be more vigorous than the top and if not removed may overgrow it. Suckers can be minimized by selecting crabapples grown on their own roots, but own-root trees are very hard to find. An understock called MM111 adapts to a wide range of soils and produces fewer suckers than most others. Try to avoid crabapples grown on common apple. Even crabapples on their own roots may produce some suckers, but if that happens the plant will just become a multistemmed cultivar. If you don't want your plant to become multistemmed, prune the suckers at their point of origin annually in mid- to late summer.

Water sprouts are upright, vigorous shoots that arise above the graft junction on the trunk and branches. They tend to be vegetative (nonflowering) and if left too long become a part of the structure. Strategically located water sprouts can be left to develop the tree's structure and form. Prune others in mid- to late summer. If you prune too early, new ones will grow to take their place. *—Thomas L. Green*

is notorious for defoliating trees when both spring and early summer weather is wet, while cedar-apple rust, a problem in areas where junipers are growing, will also cause leaves to drop prematurely. The damage from powdery mildew, also common where humidity is high, is primarily aesthetic. The most serious threat to the health of a tree is fire blight, a bacterial disease that can be fatal (see sidebar, above).

Crabapple fruit can be lime green, amber, gold, yellow, orange, red, dark red, or purple, although gold, orange, and red are usually the most vivid in the fall landscape. Fruit color can last for a month or more, but some cultivars have fruit that retains a reddish hue after hard frost and even as late as February.

Crabapple fruit can range from one-quarter inch up to two inches, but the best are about the size of cherries, half an inch or less in diameter, because they tend to be the most persistent. Large fruit is heavy for the fruit stalk and drops off the tree quickly, rotting and making a slick, slippery mess that often attracts yellow jackets.

The fruit of many quality cultivars is attractive to birds, squirrels, and sometimes other wildlife. Some cultivars seem especially attractive to fall migrating birds such as robins and cedar waxwings, while those that retain fruit until spring will feed migrators on their return trip.

A few crabapple cultivars have flowers but do not set fruit. They are useful near sidewalks or in other areas where falling fruit can't be tolerated, but otherwise have limited landscape use. They also tend to be more susceptible to disease.

A frequent landscaping mistake is choosing a tree that will grow too large for its space. Less often, a too-small tree is planted in a comparatively generous space. Crabapples vary greatly in size, from mature heights of three to 40 feet, and in shape, offering habits that are shrubby, weeping, horizontal, vaselike, round, and upright.

When selecting a crabapple, flowers should be considered last rather than first because the floral display lasts only a week or two depending upon weather conditions. With all of the ornamental trees available today, there is no reason to consider a tree that is mediocre 51 weeks of the year.

There are three basic colors of crabapple flowers—white, pink, and red—and four distinct flowering stages—tight bud, balloon, full bloom, and petal drop. White flowers are by far the most common; all the cultivars listed here are white flowering unless otherwise noted. In general, the pink- and red-flowering crabapples tend to be more susceptible to scab. Almost all the crabapples begin with pink or red tight buds. The white-flowering cultivars fade to pink at balloon stage and open white, although some will keep a reddish petal margin before fading. The pink- and red-flowering cultivars stay red or maroon at balloon stage. Some of the pink cultivars will fade to white or nearly white by petal drop, and red cultivars may fade to pink at that point.

Crabapple flowers are usually pleasantly fragrant—all 10 of these proven performers are—and can be single (five petals), semidouble (six to 10 petals), or double (more than 10 petals). Some trees, described as annual bearing, have a profuse display year after year, while cultivars categorized as alternate bearing may have a showy display one year and nothing the next. A quality crabapple should have attractive, abundant, fragrant flowers year after year.

While there are many high-quality crabapples for landscape use, there is no single cultivar that will work in every landscape in all parts of the country. In addition, there are many high-quality crabapples not

readily available through local nurseries and garden centers, and many promising new selections not yet released to the trade.

To help professionals and consumers choose the best available crabapples, the National Crabapple Evaluation Program was initiated in 1984. Its goal was to test at 23 locations throughout the country 46 crabapple cultivars that were readily available in the nursery trade. Between 1990 and 1993, four fall evaluations were made at each location, rating the trees for overall appearance and disease resistance.

Below are 10 cultivars that could be considered most desirable overall, based on the results of the evaluation program. It is difficult to limit the list to 10, since few trees rank high in every category. Some that came out on top in other respects are susceptible to fire blight and should not be used where this disease is a problem. Some of them may not be readily available from retail nurseries, but all can be ordered by local nurseries from commercial wholesale sources. With one exception, all of them can be relied upon to bloom annually. Most have fruits between a half-inch and five-eighths inch in diameter, and most are average-sized crabapple trees, growing to 20 or 25 feet with a similar spread.

The **'Adams'** crabapple, a chance seedling found in a Massachusetts nursery in the late 1940s, is one of the best of the red-flowering crabapples. The fragrant flowers are extremely abundant, while the dark red, barrel-shaped fruit is quite persistent. It forms a dense, round crown and makes a good hedge or screen. In areas where there is very heavy spring precipitation, such as the Pacific Northwest, it will defoliate with scab.

Although **'Bob White'** has been around for a while—it was introduced by the Arnold Arboretum in 1876—it is unfortunately still rather hard to find. For gardeners who live where scab is a problem it is worth the search, since it is very resistant to that fungal disease. The abundant white flowers are followed in fall by amber to golden fruit that is popular with birds. This is also a good choice for those who like a crabapple with a horizontal spread. 'Bob White' definitely needs more promotion.

In certain test plots the **'David'** crabapple is always at or near the top. The late Des Moines, Iowa, nurseryman Arie den Boer received seedlings from the Morton Arboretum in 1940 and named it for his grandson. It has a pleasant, round, open habit. The glossy, bright fruits keep their color after frost and may be eaten by birds in late winter after they soften. It is the one tree on this list that can be alternate bearing. It is also slightly susceptible to scab.

Another tree that has performed well at most of the national test sites is **'Donald Wyman'**, which ranked third overall. It was named for the former horticulturist of the Arnold Arboretum, where it was discovered in 1950. Raising it from a good ornamental to a great one is its appearance in fall, when yellow foliage combines with glossy, brilliant red fruits that remain colorful all winter. Its habit is round and compact. Scab can cause defoliation after wet springs.

One of my personal favorites is the **Japanese flowering crabapple, *Malus floribunda***, thought to have been brought to the West from Japan around 1862. Its major attribute is its prolonged, abundant bloom period, when simultaneously there are flowers in tight bud, balloon stage, and full bloom. Although white in full bloom, the unopened flowers give an overall pink effect from a distance. In fall, it's fun to watch birds feast upon the sweet ripe fruits, which are amber at first turning to brown as they ripen. Its horizontal habit makes it an elegant specimen tree, and it should be easy to find.

Also easy to find is **'Prairifire'**. This cultivar was introduced only about 14 years ago by Daniel F. Dayton of the University of Illinois–Urbana, but it has become very popular. Deservedly so, since it has proven in the national test plots to be the best red-flowering crabapple by far. While the red of many others tends to become muddy with maturity, that of 'Prairifire' remains clear and reddish pink through petal drop. Its fruit, while dark like that of most red-flowering crabapples, is especially glossy and showy, and the leaves, which are reddish when they emerge, offer a bonus display of red, orange, and purple in fall. Its rather slow and upright growth when young—it spreads somewhat as it matures—makes it a nice choice for narrow landscape sites.

The single biggest drawback to **'Professor Sprenger'**, named for a Dutch horticulture professor and introduced a half-century ago, is its lack of availability. It ranks high in most of the national test sites, finishing second overall, in large part because of its spectacular display of orange-red, persistent fruit that retains color into winter. Its dense habit is upright and spreading to round.

'Snowdrift', a 30-year-old cultivar, is

COURTESY OF THOMAS L. GREEN

GALEN GATES

COURTESY OF THOMAS L. GREEN

The fruit of* Malus ×zumi *'Calocarpa', top, will remain on the tree all winter. Red buds that open to white flowers give the Japanese flowering crabapple, middle, a pink effect from a distance. Its amber fruits, above, are loved by birds.

Crabapples are spectacular in bloom, below right, but that brief show shouldn't be the chief consideration in choosing one for your landscape. 'Bob White', seen in the lower right hand corner, is both beautiful and scab resistant. The leaves of 'Prairifire', below, considered the best red-flowering crabapple, turn red, orange, and purple in fall, when the persistent red fruit of 'Donald Wyman', bottom, is made even more striking by yellow foliage.

PHOTOS COURTESY OF THOMAS L. GREEN

popular because of a consistent display of white flowers and yellow, orange, to orange-red fruit, and a predictable round, uniform habit. Because the three-eighths-inch fruit stays on the branches long enough to soften in fall, it is great for attracting birds. Unfortunately, it shouldn't be used where fire blight is a problem, and it is more susceptible than the others to defoliation by scab. It may be worth the effort of a preventive spraying with fungicide where rainy springs are common, and it should be fairly easy to find.

Harder to locate will be **Sugar Tyme,** a relatively new trademarked crabapple produced by Lake Country Nursery in Perry, Ohio. It rates fifth overall at national test locations. The white flowers are followed by bright red glossy fruit that retains its color after frost. The habit is upright and spreading to round.

If I were restricted to only one crabapple, it would have to be ***Malus* ×*zumi* 'Calocarpa', the redbud crabapple.** I'm not alone, since this tree finished first in the national crabapple fall evaluation. The flowers are exceptionally abundant, and the bright red fruit retains its color, staying on the branches to be enjoyed by birds in both fall and spring. Golden leaves often add to the fall show. It has a horizontal habit, sometimes spreading to 30 feet. Scab is seen only in extremely wet spring weather, and fire blight has rarely been reported, although it probably should not be used where fire blight is severe.

Introduced in the United States by the Arnold Arboretum from seed received from Japan in 1890, the redbud crabapple should be readily available, but it must be cloned rather than propagated from seed. When buying this cultivar, make sure that the tree is labeled *M.* ×*zumi* 'Calocarpa' rather than 'Zumi', which is a different and less desirable cultivar.

All of the top 10 proven performers are single flowered. No one has yet developed a good pink or red double-flowering crabapple. All of them are prone to disease and have sparse and often messy fruit. And good double-flowering whites are rare. In most cases the petals don't drop but stay on the tree until they turn brown and wither away. Among the exceptions, I like 'Doubloons' the best. Produced by J. Frank Schmidt & Son Company in Boring, Oregon, it has nice golden fruit and double flowers that last longer than the singles. It is slightly susceptible to scab, but less than the other doubles.

Although weeping and dwarf forms are not new, none really meet the criteria of being both disease resistant and readily available.

Weeping crabapples worth looking for because of their disease-resistance are 'Louisa', introduced by Polly Hill of Martha's Vineyard, Massachusetts, which has pink flowers and gold fruit, and 'Anne E', developed by Manbeck Nursery in New Knoxville, Ohio, with white flowers and red fruit. The trademarked Molten Lava, developed by the late Father John Fiala of Medina, Ohio, and introduced by Lake County Nursery and Klehm Nursery in South Barrington, Illinois, has a strongly horizontal to semi-weeping habit, white flowers, red fruit, and a nice yellow fall color. It has consistently finished near the top in the crabapple evaluation trials, but will probably be hard to find in local nurseries.

Among the true dwarfs that have been on the market for any length of time, all are flawed. 'Sargent' (nine feet tall and 15 feet wide) and 'Mary Potter' (12 feet tall and 20 feet wide) are more shrubs than dwarfs, but both are good, and 'Sargent' is very disease resistant. Both are alternate bearing. 'Mary Potter' is susceptible to scab and fire blight. Christmas Holly, a trademarked tree developed by Father Fiala and named for its small red fruits, has performed very well in trials. It grows to only 15 feet, but may not be a true dwarf. 'Pink Princess', new from Schmidt, is about the only red-flowering dwarf of merit. It grows eight feet tall and 12 feet wide, with leaves that emerge purple.

We can hope that, as consumers demand health as well as beauty in their crabapples, there will be cultivars of every shape, size, and color worthy of being added to a list of proven performers.

Formerly research plant pathologist at the Morton Arboretum in Lisle, Illinois, Dr. Thomas L. Green is a founder of the International Ornamental Crabapple Society and now heads the urban forestry program at Western Illinois University.

SOURCES AND RESOURCES

The International Ornamental Crabapple Society, founded in 1985, is dedicated to the collection and dissemination of information about the ornamental crabapple (and even those that may not be so ornamental). The society publishes two issues of its bulletin, *Malus*, and two newsletters each year. Annual dues are $20.

The fall 1995 *Malus* contains disease and aesthetic ratings of hundreds of crabapple cultivars for various regions of the country (divided by time zone and hardiness zone). A copy can be obtained for $10, postage paid. Anyone interested in that publication, other cultivar information or recommendations, or information about the society can write or call Dr. Thomas L. Green, Agriculture Department, Western Illinois University, Macomb, IL 61455, (309) 298-1160, or fax (309) 298-2280.

Sources of crabapples include:

Arborvillage Farm Nursery, P.O. Box 267, Holt, MO 64048, (816) 264-3911. Catalog $1.

Arthur Weiler, Inc., 12247 Russell Road, Zion, IL 60099, (708) 746-2393. Catalog free.

Brehm's Wondercreek Nursery, N6050 South Crystal Lake Road, P.O. Box 368, Friesland, WI 53916, (414) 885-4300. Catalog free.

Forestfarm, 990 Tetherow Road, Williams, OR 97544, (503) 846-6963. Catalog $3.

Southmeadow Fruit Gardens, Lakeside, MI 49116, (616) 469-2865. Catalog free.

GALEN GATES

JOANNE PAVIA

The 'David' crabapple, top, has a pleasing shape and long-lasting berries, although it may not bloom every year. 'Snowdrift' is susceptible to fire blight and scab, but its colorful berries, above, make it worth a preventive spraying.

Boxwood

Little-known cultivars of this classic make it a versatile choice for any landscape.

BY LYNN R. BATDORF

COURTESY OF LYNN R. BATDORF

Boxwoods lend themselves to a variety of shapes and forms. Some, such as* Buxus microphylla *'Compacta', above, respond well to the careful training required for bonsai. At Colonial Williamsburg, Virginia, opposite, triangular hedges of edging box enclose spring displays of tulips in this parterre garden.

Boxwood has enriched humankind for centuries as both a landscape plant and a source of lumber. As early as 4000 B.C. the Egyptians clipped boxwood into formal hedges. References to boxwood have come down to us from a number of famous historical and literary sources, including a reference in the Greek poet Homer's *Iliad*—written around 800 to 900 B.C.—to boxwood yokes for horses. The Greek scholar and botanist Theophrastus, who died early in the third century B.C., recorded the virtues of boxwood as timber.

Boxwood is extremely dense as well as flexible and uniform. As a result, the ancient Greeks and Romans used it to make many superior products, including writing tablets, musical instruments, spinning tops, combs, jewelry cases, carved ornaments, inlays, and veneers. These same characteristics renewed the demand for boxwood centuries later when the power loom was invented. Imports of boxwood to England for this purpose averaged around 6,000 tons annually in the late 19th century.

Less expensive woods have replaced boxwood for many lumber needs, and today boxwood is prized more for the many ways in which it adorns our gardens. In addition to traditional landscape uses as hedges, borders, and specimens, some selections lend themselves to such diverse elements as topiary, container gardening, and even bonsai.

The most common criticism of boxwood has related to its relative "sameness." This arises from the fact that most homeowners grow only *Buxus sempervirens* 'Suffruticosa', the so-called English or edging boxwood. But there are more than 400 named species and cultivars of boxwood, of which about 100 are available in North America. Among them can be found boxwoods to meet a variety of landscape needs, including dwarf, variegated, cold-hardy, columnar, and spreading selections. Although as many as 70 boxwood species have been identified, most of the selections in the trade are derived from common box *(B. sempervirens)* and littleleaf box *(B. microphylla)*. The following are some of the most highly recommended cultivars.

***Buxus sempervirens* 'Suffruticosa'** is the most popular and widely grown boxwood, often referred to as edging box because of its extensive use as a border in parterre gardens. It is also commonly called true dwarf boxwood. A mounded plant with globular tufts of growth resembling a cloud, it has small, rounded leaves that give the plant a dense habit. It is notable for its slow growth rate, averaging three-quarters to one-and-a-quarter inches per year. English boxwood will live for centuries without growing more

JERRY PAVIA (LEFT), ANITA SABARESE (RIGHT)

The finely textured, dense foliage and slow growth of edging box* (Buxus sempervirens *'Suffruticosa'*), *above, has made it a favorite with gardeners for centuries.* Buxus sempervirens *'Arborescens', above right, commonly called tree box, grows taller than edging box and is generally regarded as being a bit less refined.

than three to five feet tall. It is hardy to USDA Zone 5.

***Buxus sempervirens* 'Arborescens'** is often—despite its European and Asian origins—called American boxwood to differentiate it from the so-called English boxwood. This is probably the second most commonly used boxwood. Its large size—20 feet tall and 15 feet wide is typical for a 40-year-old plant—dictates its use as a large hedge or in screen plantings. Specimens have been known to live 175 years. It is hardy to Zone 5 or 6.

For a striking columnar focal point or very formal screen, ***Buxus sempervirens* 'Graham Blandy'** develops into an exceptionally narrow, upright plant that can reach 15 to 18 feet at maturity. Lateral shoots (not the main leader) should be pruned to maintain the vertical form; spring growth is occasionally pulled down by rain. A 20-year-old plant will be about nine feet tall and one foot to 18 inches wide. It is reliably hardy to Zone 6, and possibly into Zone 5.

A more unusual ornamental is ***Buxus sempervirens* 'Pendula'**, which has a unique asymmetrical open growth habit with, as its name implies, weeping branches. A 30-year-old plant will be five-and-a-half feet tall and, as long as it is not permitted to layer, only five feet wide. A favorite since the late 19th century, it is hardy to Zone 5 or 6.

Among the best of the cold-hardy selections is ***Buxus sempervirens* 'Vardar Valley'**, a cultivar hardy to Zone 4 collected in the Vardar River Valley in northern Greece and the southern section of the former Yugoslavia. Spring growth has a prominent bluish cast that slowly fades by late summer or fall to the dark green that is retained throughout the winter. There are apparently two forms of this cultivar, both of which have a broad, spreading habit. The more common form grows to about three feet at maturity.

Another good choice for northern gardeners is the Korean boxwood ***Buxus sinica* var. *insularis* 'Justin Brouwers'** (formerly listed under *B. microphylla* var. *koreana*), which is dependable to Zone 4. It has pointy, dark green leaves and forms a handsome conical shape. Mature size is unknown, but is unlikely to top five feet. A 20-year-old specimen at the U.S. National Arboretum in Washington, D.C., is less than three feet tall.

For those who want variegation, ***Buxus sempervirens* 'Elegantissima'** is the best choice. Hardy to Zone 6, its small leaves

have an irregular creamy white margin with a green center. The mature size is seven feet tall and seven feet wide.

There is a lot of choice among low-growing or dwarf boxwoods, but the littleleaf box cultivar ***Buxus microphylla*** **'Compacta'** is one of the most tried and true. Grown since 1912, it is sometimes mistakenly labeled 'Kingsville Dwarf' after the Kingsville Nursery in Kingsville, Maryland, from which it was first distributed. This is the slowest-growing boxwood, with an average annual growth of between one-quarter and one-half inch. The leaves are a half-inch long and less then a quarter-inch wide. Hardy to Zone 5, it has a tight, low mounding habit and grows best in full shade. Twenty-five-year-old plants average 10 inches in height and 18 inches in width.

Buxus microphylla **'Green Pillow'** is similar to 'Compacta' except that the leaves are about twice as large. This selection's dense, compact habit makes it well suited as a border or edging plant. At 30 years of age this plant can be 30 inches high and 40 inches wide. It is hardy to Zone 5.

Also hardy to Zone 5, ***Buxus microphylla*** **'Grace Hendrick Phillips'** is a handsome, broadly conical dwarf plant with small leaves that retain their dark green

KEEPING BOXWOOD HEALTHY

Boxwood is a relatively low-maintenance, durable, ornamental shrub that will excel if properly cared for. It can be grown successfully in most of the continental United States, with the exception of the Rocky Mountain region, northern Great Plains states, and those states north of Zone 4. In these areas boxwood tends to succumb due to a combination of low rainfall, dessicating winds, and extreme temperature fluctuations.

Two important maintenance activities will help keep boxwood healthy. The first is to maintain a soil pH between 6.5 and 7.2. If the pH is too low, add dolomitic limestone. The second maintenance task is thinning, which improves air and light circulation through the interior of the plant, thus reducing the chance of infection by fungal diseases such as *Macrophoma* and *Volutella*. A "thin-shake-and-rake" strategy gives the best results. First, selectively thin the boxwood to reduce dense foliage and remove dead twigs. Then shake the branches vigorously to force the debris to fall to the ground. Finally, a leaf rake can be used to collect the debris for disposal.

Early fall is the best time to plant or transplant boxwood. This allows the plant time to produce new roots before the new foliage develops in spring. The root ball ought to be at least as wide as the drip line of the plant. The depth of the ball is usually determined by the height of the plant. A four-to-one ratio provides a general guideline. For example, a six-foot-tall boxwood should have a root ball one-and-a-half to two feet deep. When planting, consider how large the plant will be at maturity; future overcrowding can be avoided if the ultimate size is known. Most boxwoods do best with part sun during the growing season, but the site should offer protection from sunshine and wind during the winter. Plants exposed to continual, direct sun in winter will develop reddish brown or yellow leaves due to rapid temperature changes. Boxwoods planted close to the south or west sides of buildings often experience winter bronzing. Ensuring a consistent supply of water in late fall and early winter can help reduce winter damage.

COURTESY OF LYNN R. BATDORF

At 15 years old, these eight-foot **Buxus sempervirens** ***'Graham Blandy' specimens provide a formal, vertical effect.***

Another good practice is mulching the boxwood with a one-inch layer of shredded hardwood bark. Avoid mounding mulch under branches, which will encourage adventitious rooting, or placing mulch next to the trunk, which can attract voles.

Tying up the branches of boxwoods will protect them from snow and ice damage. First, tie string securely to the main trunk at the base of the shrub. Then wrap the string in an upward spiral, at the same time pressing the branches upwards and inwards. Work up to the top of the plant then back down and tie the string onto the trunk again. The rows of string should be about eight to 10 inches apart to provide the best support.

Boxwoods are propagated by stem cuttings that can be taken from July to December. Take cuttings from one- or two-year-old branchlets. Remove the leaves from the bottom one inch of the cutting. Treat this bottom portion with a rooting hormone, then place the cutting in a rooting medium consisting of equal portions by volume of pine bark; coarse, sharp builder's sand; and perlite. Rooting usually occurs in two to three months. During this time, the cuttings benefit from high humidity. The plants can be planted outside in a protected area the following spring.

—Lynn R. Batdorf

PHOTOS BY JERRY PAVIA

Hardy to USDA Zone 4,* Buxus sempervirens *'Vardar Valley', above, has a bluish tint to its foliage from spring through fall. Most boxwoods make excellent container plants, but* B. sempervirens *'Elegantissima', above right, offers variegated foliage as well.

color throughout the year. By 20 years of age it will grow to two feet tall and three feet wide.

Slightly less hardy (Zone 6) is ***Buxus microphylla* var. *japonica* 'Morris Midget'**, a dense boxwood with a smooth, low-mounded outline. Very slow growing, at 40 years of age it will be only one-and-a-half-feet tall and three to four feet wide.

The hardiest of the compact boxwoods (Zone 4) is ***Buxus* 'Green Mountain'**, reportedly developed from a cross between *B. sempervirens* 'Suffruticosa' and Korean boxwood. This selection has a good, dense pyramidal habit with attractive foliage that remains dark green throughout the winter. A 10-year-old plant is three feet high and 18 inches wide; the mature size has yet to be determined.

Because of their slow growth and ability to adapt to the demanding cultural conditions of bonsai, *B. microphylla* 'Compacta' and *B. microphylla* var. *japonica* 'Morris Midget' are commonly used for that purpose.

Traditionally, boxwoods have been used primarily as accent plants for the border, as hedges, or grouped for a mass effect. Contemporary gardens tend to be smaller and more intimate, and the selection of plants should reflect this. Some of the newer boxwoods, especially the mounded or columnar forms, make excellent specimen plants for the small garden, providing year-round color and acting as a centerpiece around which beds can be developed.

Lynn R. Batdorf is curator of the National Boxwood Collection, as well as perennial and aquatic plants, at the U.S. National Arboretum in Washington, D.C. He recently authored The Boxwood Handbook: A Practical Guide to Knowing and Growing Boxwood, *which is available through the American Boxwood Society.*

SOURCES AND RESOURCES

The American Boxwood Society is a nonprofit organization founded in 1961. It publishes *The Boxwood Bulletin* quarterly, holds annual meetings, conducts tours and workshops, and supports the Memorial Boxwood Garden at the Virginia State Arboretum in Boyce, Virginia. Membership is $25 per year and includes a subscription to *The Boxwood Bulletin*. For more information write to: The American Boxwood Society, P.O. Box 85, Boyce, VA 22620-0085.

Mail-order sources of boxwood include:

Appalachian Gardens, P.O. Box 82, Waynesboro, PA 17268-0087. Catalog free.

Forestfarm, 990 Tetherow Road, Williams, OR 97544-9599. Catalog $3.

Wavecrest Nursery, 2509 Lakeshore Drive, Fennville, MI 49408, (616) 543-4175. Catalog $1.

Regional retail sources include:

Feil's Nursery, 84 First Avenue, Massapequa Park, NY 11762-2550, (516) 798-9212.

Foxborough Nursery, 3611 Miller Road, Street, MD 21154, (410) 836-7023.

Hildebrandt Nurseries, Box 52, Main Street, Oldwick, NJ 08858, (908) 439-2256.

Kimberly Boxwood Gardens, 16720 SW Wilsonville Road, Wilsonville, OR 97070, (503) 625-7904.

Saunders Brothers, Inc., Route 1, Box 26A, Piney River, VA 22964, (804) 277-5455.

(A more complete listing of nurseries is available from the American Boxwood Society in the Boxwood Buyer's Guide.)

Violets

The incredible shrinking violets can send you into olfactory overload.

BY TOVAH MARTIN

You might imagine that you've experienced life to the fullest. You might have seen all the latest plays, read all the most acclaimed books, and dined in the finest eateries. But you haven't really lived until you've inhaled fragrant violets.

I'm not talking about those modern hybrids with lusty flower heads but lackluster scents, requiring heavy doses of imagination to draw any smell whatsoever. I'm speaking of old-fashioned *Viola odorata* and its kin with modest flower heads but oversized scents. They are the famous shrinking violets. Dowdy at first glance, to be sure. But any lack of physical charm is redeemed upon closer inspection. One whiff can send you reeling, and deeper inhalations can throw your scent receptors out of commission for several minutes. Anyone willing to come near is bound to discover their potent perfume. Intimate olfactory interaction is what humble fragrant violets are all about.

It was the shrinking violet's meek persona that became its undoing. The violets worn in buttonholes and bunched in nosegays for centuries were plucked spontaneously from the field. In the late 19th century, when violet-filled tussie mussies became all the rage, they too began as dowdy little flowers clustered together for

COURTESY OF TOVAH MARTIN

Breeding violets for long stems so they could be "bunched" into bouquets robbed many of scent. But 'Lady Hume Campbell' and 'Swanley White' are among those that retained their nose-numbing aroma.

SECRETS TO SUCCESS WITH VIOLETS

Violets grew fruitful and multiplied in the typical Victorian home, and little wonder. Nineteenth-century houses were notoriously drafty, and that's just the sort of place violets adore. While we walk around shivering in sweaters and mittens, violets have a field day. Violets also prefer shady windows to sun-drenched sills, so a gloomy Victorian parlor was completely to their liking. In homes of more recent vintage, an east- or west-facing window would be ideal.

While modern homes have let us peel off a few layers, they are often too toasty for violets. They'll send out all sorts of lush runners, but they won't bloom when temperatures continually push above 50 degrees at night. (Daytime temperatures are not an issue.) In winter, grow violets on the shady side of a scarcely heated sunporch or in an unheated breezeway. When summer temperatures soar, it's nearly impossible to keep a violet in bloom. Provide plenty of water and sprinkle the leaves to keep them from wilting until the weather moderates.

You may need to perform additional heroics. Violets are sinfully attractive to several pests. In midsummer a violet free of red spider mites is a rarity indeed. Prevention is the best solution. Spray your violet foliage frequently with a jet stream of ice cold water—red spider mites apparently abhor clammy environments, preferring to hang out in warm, dry places.

Runners-up among violet pests are whiteflies, which can be controlled with yellow sticky traps, and mealybugs, which can be destroyed with a cotton swab dipped in alcohol.

If your violets are contented, they will cover ground. With astonishing speed, they form divisions that carpet the container and begin to clamber over the edges of the pot. Without some intervention, they will eventually smother in their own enthusiasm. By dividing the plant, you can easily increase your own bounty or share the progeny. Divide often, tearing the crown into pot-sized chunks. If you're serious about increasing the flock in a big way, plant violets in a shallow flat and let them run along the surface, digging up the runners and potting them separately the moment they begin to make roots. Since violets send down rather shallow roots and dislike soggy soil underfoot, an azalea pot—wider than it is tall—is preferable.

COURTESY OF TOVAH MARTIN

The parma violet 'Marie Louise' is often used outdoors as an edging plant in warm climates.

Although violets require plenty of water to keep their foliage from wilting, overwatering will rot their crowns. Anchor them in a fluffy growing medium with plenty of peat moss, and water them when the soil becomes slightly dry to the touch. Fertilize violets once a month with a 20-20-20 solution or any balanced feed.

Although I prefer my violets in pots for olfactory purposes, they make fine ground covers in the garden. Most of the *Viola odorata* hybrids are perfectly hardy. In fact, they remain green throughout most of the winter, providing the first blooms of spring. The double parma hybrids, however, are all tender, refusing to endure anything colder than USDA Zone 6. From there south, parmas make handsome edging plants, 'Marie Louise' being most often enlisted for the job.

Violets are greedy for elbow room, so don't position these creepers beside something less assertive—when it comes to territorial disputes, violets will undoubtedly win out. Violets require part shade in the garden, and they'll need watering during a drought. Frequent hosing down is definitely to their benefit, but even a gentle sprinkling will quench flagging flowers and foliage. Clearly, these are not set-'em-and-forget-'em plants. But once you've imbibed the dizzying fragrance of the sweet shrinking violet, there's no possibility of forgetting them, and in time, these modest cultural requirements will seem to shrink as well.

—Tovah Martin

impact. But breeders felt certain that any good thing could be improved, and that's how double parma violets became the rage.

The original blue-flowering *Viola odorata* and its close relatives have five small petals set in an elfish sort of configuration crowning a short stem. The parmas, by contrast, boast a tuft of numerous tiny petals, all gathered in haphazard confusion. Perhaps the resulting posy isn't the cutest in creation, but the scent is out of this world. In fact, some perfumers say that parma violets are the sweetest blossoms known to mankind.

There is no denying that parma violets were a blessing for the florist industry, but they suffer from several major drawbacks, the most serious of which is their tender disposition. The origin of the parmas is one of horticulture's great mysteries, although their ancestors are thought to have originated in Asia Minor, and the first parma cultivars came from the Italian peninsula. The French called them Naples violets, and the Italians called them Portuguese violets. They began to charm the British in the early to mid-1800s. Whatever their true politics, the strain was not particularly cold hardy, so that double parmas can't endure protracted exposure to temperatures below 20 degrees. In most parts of this country they must be sheltered indoors over the winter. They make a handsome little pot plant with heart-shaped leaves and pomponlike blossoms dangling over the edges. As long as the room they're in isn't too hot or too cold, parma violets' scent is still a credit to their clan.

Still not content with the God-given virtues of *Viola odorata*, florists decided that a little more manipulation might enhance the single flower's marketability. In particular, they were concerned about the "bunching" potential of that pert blossom—how handily it could be made into a bouquet—and the obvious remedy was to breed for longer stems. Sure enough, given a few generations of seed selection, they obtained the sort of blossoms that could easily be tied into a nice tidy bunch. But they simultaneously lost the scent.

Have you ever noticed that long-stemmed roses, long-stemmed sweet peas, and all the other flowers heavily manipulated by the florist industry seem to be lacking in perfume? Fragrant violets went the same way, and suddenly *Viola odorata* was a blatant misnomer. Before long, florists were selling nosegays that totally lacked any appeal to noses, and the nursery busi-

MICHAEL S. THOMPSON

COURTESY OF TOVAH MARTIN

COURTESY OF WAYSIDE GARDENS

In nature, the sweet violet is usually purple, but occasionally pink or white, left. 'Swanley White', above, is a double form developed in 1880. 'Rosina', right, is an eye-pleaser, but the look-alike Viola odorata *var.* rosea *is a treat for the nose as well.*

ness turned its attention to the larger-blooming violas and pansies bred for showy flower beds. Meanwhile, parma violets were becoming so heavily overbred that most hybrids fell victim to disease. By 1940, fragrant violets had slipped into obscurity in this country.

Fortunately, the British never lost their affection for fragrant violets. Even in the 1950s, at the lowest ebb of this flower's popularity, a few specialty British nurseries still carried a handful of the old, intensely fragrant hybrids such as 'Perle Rose' (pink, 1902), 'Prince of Wales' (deep royal purple, 1889), 'Admiral Avellan' (reddish purple, 1893), and 'Coeur d'Alsace' (rosy salmon, 1916). Not only did they preserve the original stock, but they stubbornly created further fragrant hybrids such as 'Fair Oaks' (white enhanced with purple), 'Mrs. R. Barton' (white with lavender veining), 'Lydia Groves' (pale pink edged with a band of silver), and 'Charles William Groves' (deep pink edged with a band of silver). All were bred with the nose in mind.

The beauty of fragrant violets is that once you have fixed that aroma in your memory, you never really forget it. My mother-in-law, Joy Logee Martin, who came from a family of florists, remembers knocking on doors as a child with her basket of violet corsages in hand. *Viola odorata* and *Viola odorata* var. *rosea* remained in the Logee collection, while the less robust hybrids slipped away. But my mother-in-law is a person who will search doggedly to the ends of the earth for a favorite flower. When she solemnly swore to find parmas again, she sent to Britain, acquired the requisite import permits, coddled the newly arrived immigrants, and propagated like crazy. Pretty soon, several *Viola odorata* hybrids as well as a handful of parmas such as 'Marie Louise' (double dark lavender with orange in the center, 1865), 'Swanley White' (also known as 'Comte Brazza', double white, 1880), and 'Lady Hume Campbell' (double pale lavender, 1875) were available again.

Apparently many other people held a lingering memory of the violet's evocative scent, because the plants were in great demand as soon as the public caught wind of their return. Unfortunately, there was some initial confusion: Gardeners were suspicious of the whole *Viola odorata* clan when they ordered cultivars such as 'Rosina', 'Freckles', and 'White Czar' assuming that scent is part of their profile.

While the hardy *Viola odorata* hybrids make fine garden plants, they run lickety-split over the ground, nudging out their bedfellows with a bullishness that belies their shrinking reputation. In my opinion the garden is not the best place to showcase the violet's sweeter-than-sweet scent. After all, not many of us enjoy crawling around the garden on all fours when we're not down there weeding, and you really do have to nestle pretty close to the soil in order to catch a whiff of a fragrant violet.

So I prefer my fragrant violets in pots where they can sit at my elbow and be sampled whenever I care to lean over and inhale. No calisthenics necessary. The single types look like a mat of small, heart-shaped leaves with a modest flower or two poking up, offering its face conveniently to anyone who might like to indulge. The parmas sprawl with more abandon, spilling over the edges of their pots and dangling plump blossoms too weighty to be supported by their flower stems. A hanging basket keeps the flowers easily within nose reach, or the parma might be displayed in a tall "long tom" container or a strawberry jar.

On a cool windowsill, domesticated violets provide a pleasant reminder of the garden outdoors, an association especially poignant when everything is slumbering outside. Winter is when—despite their reputation as springtime bloomers—most fragrant violets blossom vigorously. And after all, that's when we need their aroma most desperately.

Tovah Martin's latest book is Tasha Tudor's Garden. *She is garden editor for* Victoria *magazine.*

SOURCES AND RESOURCES

The International Violet Association was formed four years ago to reacquaint the public with and promote the cultivation of the genus *Viola* and specifically the violet. Membership, which is $15 in the United States, includes a quarterly publication, *Sweet Times*. The association will hold its second symposium and annual meeting in San Francisco on March 2. For more information, contact Norma Beredjiklian, International Violet Association, 10311 Granite Creek Lane, Oakton, VA 22124, (703) 591-9769.

Sources of fragrant violets include:

Canyon Creek Nursery, 3527 Dry Creek Road, Oroville, CA 95965, (916) 533-2166. Catalog $2.

Logee's Greenhouses, 141 North Street, Danielson, CT 06239, (203) 774-8038. Catalog $3.

Thompson & Morgan, P.O. Box 1308, Jackson, NJ 08527, (800) 274-7333. Seeds only. Catalog free.

Palms

Palms inspire dreams of tropical getaways, but some are also practical for everyday landscapes.

DAVID CAVAGNARO

BY DONALD R. HODEL

For those who dream of giving their gardens a tropical feel, it's hard to imagine any plants embodying such a motif more effectively than palms. With their dramatic foliage, interesting and attractive stems, and unusual displays of flowers and fruits, palms are unrivaled for conjuring up images of white sand beaches or mysterious jungles teeming with exotic wildlife.

Unfortunately, many gardeners north of USDA Zone 9 believe that palms are purely tropical plants—too tender, demanding, and "soft"—and simply out of the question for them.

Surprisingly, while most of the 2,500 palm species in the world do inhabit tropical regions, many are native to areas that experience adverse conditions, such as freezing weather and even snow in winter, extreme heat in summer, desiccating winds, and drought. Several of these hardy, tough, pest-free palms seem to thrive on adversity and neglect, and are proven performers that merit the special attention of gardeners in the borderline areas of Zones 7 and 8, as well as those in more palm-friendly climates such as south Florida and Southern California. Gardeners in even colder areas (Zone 6 and below) should consider some of these proven performers, too, since their superb adaptability to container culture, relatively slow growth rates, and characteristic, dramatic foliage at a young age make them unsurpassed potted specimens that can grace the garden or patio in summer and then be moved indoors to decorate the home in winter.

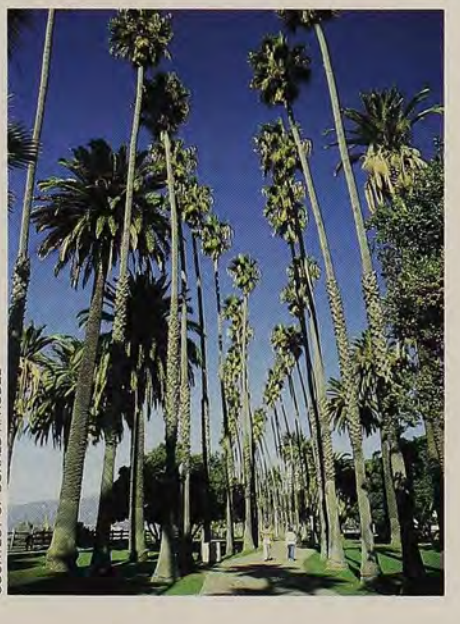
One need not look far to find a proven performer in the palm family. Our striking native **needle palm** ***(Rhapidophyllum hystrix)*** is said to be one of the cold hardiest of all palms. Rated hardy to Zone 7, a mature specimen is reportedly growing outdoors at the zone's northern edge on Cape Cod, Massachusetts. Growing naturally from Florida to South Carolina and west to Mississippi, the needle palm inhabits low, wet, humus-rich spots in dense woods and swamps, often on limestone rocks or soils. Never common throughout its range, its population was further reduced by leaf cutting for decoration at the turn of the century and then by urban encroachment and digging for the nursery trade. Fortunately, specimens that have been commercially propagated from seed are becoming more widely available.

The needle palm's many attributes make it well worth seeking out. Its short, heavy, clustering stems grow slowly to five feet and are so densely and conspicuously clothed with six- to eight-inch-long black spines that the needle palm is sometimes referred to as the "vegetable porcupine." The four-foot-wide, fan-shaped leaves are deeply divided into 15 to 20 blunt-tipped segments, each glossy green above and silvery underneath. Hidden among the dense leaves are short-branched flower stalks that carry one-inch-long, brownish fruits. When well grown and maintained, needle palm is unrivaled as an accent plant and can serve as the centerpiece of a garden.

Although tolerant of full sun, the needle palm does best with light shade, especially in the hottest part of the day. In such conditions the leaves attain their deepest green, and the leaf stalks elongate to give the plant a more open, airy look, revealing the attractive spines. To the same end, one may want to periodically thin out a needle palm that has grown into an impenetrable, nondescript mass by selectively removing

jammed or crowded trunks or young suckers, leaving a clump of well-spaced stems. Otherwise, needle palm needs only regular watering to thrive and look its best.

Another native American palm, the **dwarf palmetto** *(Sabal minor)*, occurs on moist soils in dense to open woodlands from Florida to North Carolina to Arkansas and as far west as Oklahoma, where a small cottage industry uses its leaves for making brooms and thatch. A palm native to Oklahoma? Astonishing but true, and it explains why dwarf palmetto is another of the cold-hardiest palms (also to Zone 7). Dwarf palmetto has a solitary (sometimes clustered), short, curved, mainly underground stem that rarely reaches five feet. Usually there is no visible aboveground stem, and the dwarf palmetto's five-foot-wide, fan-shaped leaves appear to



COURTESY OF DONALD R. HODEL

Landscapers have paid five figures for a well-grown Mediterranean fan palm, above, the only palm native to Europe. From Baja California and western Mexico comes the Mexican fan palm, left, here growing in Santa Monica, California's Palisades Park.

CARING FOR PALMS

Palms are relatively pest- and problem-free. They are not particular about soil so long as it is well drained. All palms need plenty of water to get started, but most of the proven performers are drought tolerant once established. During the growing season, use a palm special fertilizer or one with an N-P-K ratio of 3-1-3 or 3-1-2 plus magnesium and micronutrients (all elements preferably in slow-release form). Mulch with three to six inches of organic matter.

Palms are usually easy to propagate from seeds although they are slow growing when young. Plant seeds no more than one-eighth inch deep in a clean, well draining medium like sand and peat moss (1:1), or a commercial potting mix. Water well, then slip the labeled and dated container into a zip-lock plastic bag and place in a warm location (75 to 80°F). As seeds germinate, plant them individually in containers.

Cleanly prune off old yellow or brown lower leaves as close to the trunk as possible. Don't pull leaves off since this can wound trunks, leaving sites for disease and insect invasion and permanent, unsightly scars. An occasional thorough washing of both surfaces of palm leaves with a strong stream of water helps to remove pests and keeps the leaves dirt- and dust-free.

Situate palms carefully in the landscape. In borderline zones, plant them on the south or west side of the home or other structure to protect from cold north winds. An overhang to capture heat during the day and then release it at night is extremely beneficial. Remember the palm's ultimate size, and don't plant it too close to structures or other plants that will eventually clash with the palm and detract from its beauty. Likewise, palms make such a bold and dramatic statement that they clash easily with each other, so avoid planting different types of palms together. Plant the same kind of solitary-stemmed palms in groups of odd-numbered specimens, staggering their heights.

ANITA SABARESE

The colorful fruit of the hardy bamboo palm persists from November to April.

Good companion plants for palms include broad-leaved evergreens with a tropical look, such as ornamental figs *(Ficus)*, southern magnolia, citrus, acacias, bottlebrush, eucalyptus, pittosporums, and big philodendrons. Generally, pines and most deciduous trees look out of place with palms. Exceptions are those with large leaves and/or compound foliage like brachychitons, magnolias, catalpas, silk tree, floss silk tree, coral tree, orchid tree, and tipu tree.

Palms establish most quickly if planted and transplanted in the warmer months when they are actively growing. Palm roots need lots of oxygen, so plant them at the same depth at which they were originally grown. To transplant palms, dig a root ball at least a shovel blade's length from the stem, remove one-third to one-half the leaves in the crown, and replant in a suitable location, being careful not to disturb the roots. Mulch with organic matter and water thoroughly. Once established, water only when the soil an inch below the surface is dry.

All the palms listed here make good container plants when young, and most can be maintained this way for many years. The Mexican fan palm, however, may become lanky and too large for most containers after several years, especially when grown indoors. For container culture, use a soil mix with plenty of organic matter, such as the bagged, commercially available potting mixtures. Water containerized palms only when the soil one inch below the surface becomes dry. Then soak them thoroughly. If moved indoors for the winter, most palms will do best in bright light, such as in a south- or west-facing window. Bamboo palms are the exception: They can tolerate rather dark areas of the home for extended periods although they, too, would benefit from being placed in bright light occasionally. Remember that in the winter containerized palms' fertilizer and water requirements are lower.

—Donald R. Hodel

rise directly from the ground. The green to blue-green leaves are divided about halfway along their length into 20 to 40 stiff, pointed segments. Erect flower stalks shoot well above the leaves and hold the black, pea-sized fruits in showy clusters.

Capable of enduring a wide variety of climatic insults, dwarf palmetto looks its best in light shade and, once established, is relatively drought tolerant. Dwarf palmettos are especially striking when massed under a large tree where the virtual sea of erect fan leaves, rising directly from the ground, is a most effective and dramatic complement to spreading branches overhead.

A third native American palm, the **saw palmetto** *(Serenoa repens)*, is a conspicuous ground cover, often covering miles of territory in pinelands and coastal sand dunes from Florida to North Carolina. Its short, clustered stems can be creeping or erect, slowly growing to three feet. The three-foot-wide, green to blue-green, fan-shaped leaves are held on saw-toothed leaf stalks and are deeply cut into 18 to 24 stiff, pointed segments. Among the leaves, multiple-branched flower stalks carry one-inch-long, brown to blue-black fruits.

Hardy to Zone 7, saw palmetto is a striking plant for a border, as a featured accent, or when massed as a ground cover. The blue-green form is particularly handsome and much sought after by discriminating gardeners and collectors. Other than requiring regular watering, it is tolerant of most abuses that nature can dish out. It also seems to possess medicinal properties. A chemical compound extracted from saw palmetto has promise for treating cancer and prostate problems, and its dried fruits are a popular item in health food stores for treating bronchial distress. The flowers of saw palmetto are said to produce an unusually fine honey.

There is only one palm native to Europe, the **Mediterranean fan palm** *(Chamaerops humilis)*. It inhabits sandy, rocky ground and cliffs, usually in exposed areas near the sea but also in mountainous regions in southern Europe and northern Africa. Hardy to Zone 8, it tolerates not only cold and drought, but also desert heat and wind. Its clustered stems grow slowly to 15 feet tall and one foot in diameter, and are densely covered with old leaf bases that persist for many years, embedded in a thick mat of hairlike fibers. The short leaf stalks, heavily armed with sharp-pointed teeth, hold two- to three-foot-wide, fan-shaped leaves, each deeply cut into many

narrow, stiff segments. Their color ranges from green to silver-green and occasionally blue-green. The one-inch fruits, borne in grapelike clusters on short, multiple-branched stalks that tend to be hidden among the leaves, are also variable in color and may be yellow, brown, reddish, or purple. With age, the Mediterranean fan palm forms striking clumps that can be a garden showpiece.

Well-grown specimens are in great demand and fetch top dollar for large landscape projects around hotels and other public buildings. Some Las Vegas hotels have paid $30,000 and up for unusually spectacular specimens. Like the needle palm, the Mediterranean fan palm can become overgrown and needs an occasional thinning out to lend the plant a more open look and reveal its attractive stems and embedded, peglike leaf stalks.

The **pindo or jelly palm** ***(Butia capitata)*** is the hardiest of the feather- or pinnate-leaved palms. Native to seasonally dry areas of Brazil, Argentina, and Uruguay, it is a tough and adaptable plant, and, like the Mediterranean fan palm, will take some cold as well as desert heat and hot, dry winds. It is rated hardy to Zone 8.

Growing slowly to 20 feet, the pindo palm has a rather stout, one-and-a-half-foot-diameter trunk densely covered with stubby, spirally arranged, old persistent leaf bases that look almost like shingles on a roof. After many years, the leaf bases will drop to reveal an attractive, smooth, gray-brown trunk. The gray to blue-green arching leaves are six to 10 feet long and held on prominently toothed stalks. They're shaped like feathers, with numerous, narrow leaflets held stiffly erect, giving the palm a uniquely formal appearance. Flower stalks emerge from among the leaves but eventually hang below them when heavily laden with one-inch, yellow to orange fruits. Somewhat tart but wonderfully aromatic and subtly flavored with the essences of apricot, pineapple, and mango, the fruits are excellent when eaten fresh and make tasty jellies, jams, and preserves.

Pindo palm is unsurpassed as a silver-gray or blue-gray accent and for lending a formal look to the garden. It can stand alone as a centerpiece but is also effective in groups of odd-numbered specimens.

The **Mexican fan palm** ***(Washingtonia robusta)*** is the tallest and fastest growing of the proven performers. Native to desert regions of southern Baja California and western Mexico, it is right at home in the humidity of coastal Southern California, south Texas, and Florida. Although not quite as cold hardy (Zone 8) as its more disease-prone close cousin, the California fan palm (*W. filifera*), the Mexican fan palm is more adaptable and, in addition to tolerating an amazing amount of cold, is equally enduring of desert conditions.

Growing quickly to 40 feet or more, the Mexican fan palm has a slender, solitary trunk a foot and a half in diameter, often concealed by a characteristic shaggy skirt of dead leaves. Removing this skirt reveals an intriguing, criss-cross pattern of persistent leaf bases. If the skirt is left to fall off naturally, one can admire the smooth, straight, gray to brown trunk reaching for the sky.

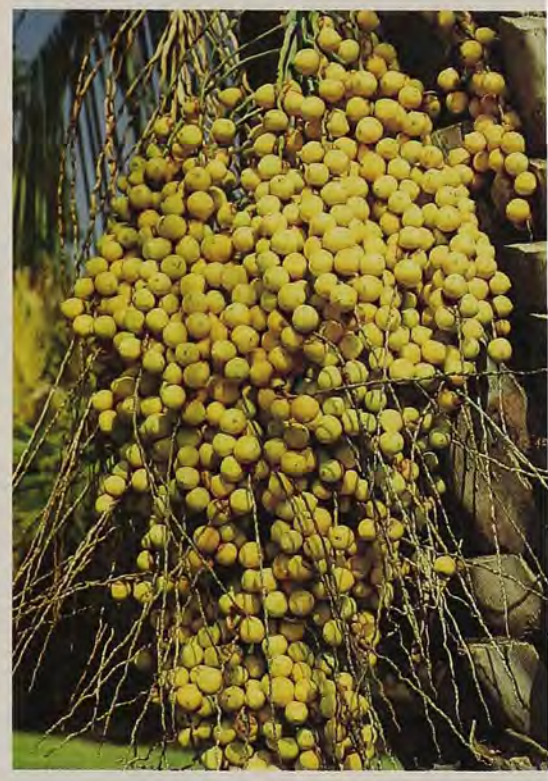
The three- to five-foot-wide, fan-shaped leaves—held by equally long, reddish brown, fiercely toothed leaf stalks—are shallowly divided into numerous segments with drooping tips and pendulous, cream-colored, threadlike filaments. The flower stalks eventually thrust beyond them with their conspicuous and copious clusters of pea-sized, black fruits.

Severe freezes sometimes kill Mexican fan palms in the Gulf Coast region, but more often they are merely defoliated and, with the advent of warm weather, quickly sprout a new crown of leaves. In the landscape, they are effective when used in long uniform lines to give a grand allée effect to drives and borders, or to divide open spaces and provide perspective. But they can also be used to create a dramatic accent when an odd number of specimens of different heights are planted in a group, perhaps with a few of the trunks leaning outward at an angle to lend additional ambience.

While most of us are familiar with the two most common bamboo palms, the parlor palm or neanthe bella *(Chamaedorea elegans)* and the clustered bamboo palm *(C. seifrizii)*, there are others in this large, diverse genus of shade-loving, understory palms that merit attention. Two of these are the **hardy bamboo palm** *(C. microspadix)* and the **radicalis palm** *(C. radicalis)*, both native to forested mountains in northeastern Mexico. Both occur on limestone rocks and are amazingly cold tolerant considering their tropical origin, withstanding temperatures in the low 20s without damage. They have even survived temperatures into single digits, suffering leaf damage, defoliation, and stem kill, but recovering quickly with the return of warm weather.

The hardy bamboo palm has neat, green, clustered, bamboolike stems to six feet tall.

PHOTOS COURTESY OF DONALD R. HODEL



Two American native palms are the dwarf palmetto, top, which grows as far west as Oklahoma, and the saw palmetto, above, which often forms a natural ground cover in pinelands and on sand dunes from Florida to North Carolina. Hints of apricot, pineapple, and mango are mingled in the tart fruit of pindo or jelly palm, center.

BEN PHILLIPS: PHOTO/NATS

MICHAEL S. THOMPSON

The Chinese windmill palm looks at home in a tropical setting, top, but can survive into USDA Zone 7, above.

Each of its two-foot-long, one-foot-wide, feather-shaped leaves has 16 to 20 S-curved leaflets that are dark velvety green above and silvery below. Showy clusters of red berries persist on the green stems below the leaves from November into April.

The radicalis palm, in contrast, is solitary, usually without a visible aboveground stem. With age, however, some will form a well-developed green stem, ringed and bamboolike, up to eight feet tall. The dark green feather-shaped leaves, usually held in a tight rosette, are two feet long and carry 20 to 35 straight, pointed, rather thick leaflets. The long, arching flower stalks hold at their ends the showy clusters of bright orange to red berries.

The hardy bamboo palm and radicalis palm do best in shade although they will tolerate some early morning or late afternoon sun. The former is effective as a hedge, screen, or background, while the latter is superb as a border or massed as a ground cover. Both are unrivaled as potted plants for tropical accent indoors or out, although for the showy fruits both male and female plants are necessary. And while these are fairly tough palms—hardy to Zone 9—wind protection and regular watering will produce the best results.

Every bit as cold hardy as our native dwarf palmetto and needle palm—into Zone 7—is the **Chinese windmill palm** *(Trachycarpus fortunei)*, which is cultivated outdoors in the British Isles, Switzerland, and Vancouver, Canada. Native to central and eastern China, its trunks are used for posts, its trunk fibers are fashioned into brushes, and its seeds are purported to have anti-cancer properties.

The Chinese windmill palm grows to 15 feet and has a six-inch-diameter trunk that seems much fatter because of its dense, curious matting of reddish brown hairlike fibers. The three-foot-wide, fan-shaped leaves are divided nearly to their bases into dark green, stiff, pointed segments. The flat, round shape of the leaves, coupled with the way the segments radiate symmetrically from the base, is reminiscent of a windmill, hence the common name. The short, much-branched flower stalks emerge from the fiber-covered trunk below the leaves, displaying purple, half-inch-long fruits shaped like kidney beans.

Like most of the other proven performer palms, the Chinese fan palm is tough and durable. In addition to cold, it will take considerable drought and all the heat you associate with the white sand beaches of your dreams. Try a palm or two in your home landscape, and bring the tropics home.

Donald R. Hodel is an environmental horticulturist with the University of California Cooperative Extension in Los Angeles.

SOURCES AND RESOURCES

The International Palm Society (P.O. Box 1897, Lawrence, KS 66044-8897), founded 40 years ago, is a nonprofit corporation engaged in the study of palms and the dissemination of information about them. Services include a quarterly, color-illustrated journal; seed bank; book store; biennial meetings with participants from around the world; horticultural correspondents committee; and membership roster. There are 21 regional chapters throughout the world. Most have regular meetings, and many publish journals or newsletters. Members can also provide and seek information about palms and communicate through the Internet using the society's electronic mail, address lists, bulletin boards, and Worldwide Web home page.

Sources of palms and/or seeds include:

The Banana Tree, Inc., 715 Northampton Street, Easton, PA 18042, (610) 253-9589. Catalog $3.

Creative Native, P.O. Box 713, Perry, FL 32347, (800) 628-4831. Price list free.

The Green Escape, P.O. Box 1417, Palm Harbor, FL 34682-1417, (813) 784-1991. Catalog $6.

Joe's Nursery, P.O. Box 1867, Vista, CA 92085, (619) 758-7042. Price list $2.

Crockett's Tropical Plants, P.O. Box 389, Harlingen, TX 78551-0389, (800) 580-1747. Catalog $5.

Jeff Marcus, Floribunda Palms and Exotics, P.O. Box 635, Mountain View, HI 96771, (808) 966-8003. Price list free.

Nurseries at North Glen, Route 2, Box 2700, Glen St. Mary, FL 32040, (904) 259-2754. Catalog free.

Plant Delights Nursery, 9241 Sauls Road, Raleigh, NC 27603, (919) 772-4794. Catalog $2.

Seed Service, 695 Joaquin Avenue, San Leandro, CA 94577, (510) 352-4291. Catalog free.

Woodlanders, 1128 Colleton Avenue, Aiken, SC 29801, (803) 648-7522. Catalog $2.

Yucca Do Nursery, P.O. Box 655, Waller, TX 77484, (409) 826-6363. Catalog free.

By Plants Possessed

When Richard Angino discovered gardening, he pulled out all the stops.

BY KATHLEEN FISHER

CHARLES W. BOWERS (RIGHT), COURTESY OF RICHARD ANGINO (TOP)

This low spot on the Anginos' Pennsylvania property, top, had a brief life as a walnut orchard before its transformation into the Alpine Garden, above.

There's a tendency, when visiting any really grand private garden, to sigh wistfully and exclaim to tourmates: "Well, here's what money can do."

That may also be your reaction the first time you visit the Angino Gardens. The 40-acre creation of Richard and Alice Angino, situated on Blue Mountain north of Harrisburg, Pennsylvania, has recently been opened to the public by appointment. You'll no doubt be awestruck by the lavishness of the undertaking, particularly the eight-acre Italian Gardens with their amphitheater, statuary, fountains, and six pools.

But spend some time talking to Richard, and you'll soon find yourself thinking, "Wow! Look what energy can do!" You begin to feel like a slug, wondering if you might have a similar garden today if only you had gotten up a bit earlier on Saturday mornings. Starting in, say, kindergarten.

Angino is a first-generation American whose steelworker father died when Richard was three. There was no gardening in Angino's family or even in his neighborhood; he stuck his first plants in the ground less than 30 years ago—roses trained up a redwood fence that he built to keep his three small sons out of traffic. "When we bought our present property, the first thing I did was plant roses under the walnuts," he says. "That's how ignorant I was. But I knew roses and thought if they looked nice on a fence they might look nice climbing up trees."

Visiting the Angino Gardens you're simultaneously a guest of the couple's home, Felicita—meaning "great happiness" in Italian. And this is a home garden, built for the happiness it brings its owners, despite the sum of its parts. It was laid out with little help from professional designers by a gardener who, like the rest of us, has made mistakes and is still learning. In fact, Angino seems as proud of his mistakes as he is of his successes. They show how far he's come. Today his collection includes hundreds of thousands of plants, from mature old beeches to the latest perennial cultivars.

"I think something inside you drives you to do certain things," says Angino, reflecting on the story he was reading of how Henry Francis du Pont had created his garden at Winterthur, Delaware. While such great gardeners were clearly driven, he says, "I doubt if any of them has been as involved in the dirt aspect of gardening as we have. I don't want to tell somebody else to do it. Everything has been designed on site. There's never anything on paper."

Whether or not you agree that Felicita is another Winterthur in the making, the notion that something drives Felicita's owner to an almost superhuman degree is not open to question. Alice, who describes her-

self as the "detail person" and practical half of this duo, says marrying Richard 20 years ago was like strapping on roller skates and never taking them off again.

Richard, now 55, was the youngest of seven children. His mother never remarried, and he did odd jobs while growing up in order to have any extras. He briefly considered the priesthood and attended seminary for two years, then won an academic scholarship to Franklin and Marshall College in Lancaster, Pennsylvania, where he played fullback on the football team. Belying all the clichés about athletes' scholastic abilities, he then won an academic scholarship to Villanova Law School.

Alice Angino, center right, seems to have the bell bottom blues as she rests from seeding bare land created by damming a stream in the 1970s. The pond eventually became the Monet Garden, below. An ambitious vegetable garden, center left, was replaced with the lushly planted Entertainment Garden, bottom.

COURTESY OF RICHARD ANGINO

COURTESY OF RICHARD ANGINO

CHARLES W. BOWERS

Graduating in 1965, he joined a Harrisburg law firm specializing in civil litigation and moved up quickly. He was an associate by 1969 and in 1978 bought the firm, now known as Angino and Rovner. Headquartered in a sprawling white house facing the Susquehanna River, it employs a total of 18 attorneys; Alice Angino is the legal administrator.

In 1967, during his first marriage, Angino bought his first real property, a World War II tract home on one acre in Camp Hill, a small town across the river. In addition to the roses and vegetables, he began flirting with conifers, which would later become a passion. "I very quickly got into blue spruces and introduced some evergreens, primarily live Christmas trees that I bought," he recalls. "I *did* instinctively understand the concept of creating a privacy barrier in a naturalistic way. I didn't plant the trees in rows!"

Richard and Alice bought the first 52 acres of Felicita in 1971, primarily as an investment. They would continue buying a few acres at a time until they had 320. "We thought that maybe we would have a little lot there eventually," says Richard.

But Alice—who grew up helping her father with a huge vegetable garden and her mother with a small rock garden—was teaching him what she knew about perennials, and already the drive to garden was in full gear. "Almost from the day we bought we were landscaping," says Richard. After the roses-under-the-walnuts episode, he began reading—not just how-to, but landscaping philosophy and garden history. He learned about prevailing winds and began planting white pines to shield the open field. Soon the place had a grip on them. The old farmhouse was pronounced termite-riddled, so they decided to build.

There was a brief but intense foray into gentleman farming, involving a cow, a horse, a corn field—and a large vegetable garden that seemed to control them instead of the other way around. The first major commitment to ornamental planting was triggered by the former owner, who described his own plans to dam a stream that drains the mountain behind the house. Angino quickly adopted the idea. "I didn't build anything as ambitious as the lake he planned—just a half-acre pond. But once I did that, the breast and the sides of the dam were bare soil, so I had to plant something."

He knew he wanted "a nice ground cover that wasn't myrtle or ivy," and followed a friend's suggestion to plant creeping St. John's-wort, *Hypericum calycinum*. Then for quick color, he added masses of azaleas and rhododendrons, perennials from gallon pots...and bulbs, bulbs, bulbs. "We're talking about thousands of different tulips, daffodils, crocuses of course, and others. It's funny to look back on pictures of it now. In the spring it looked a little like Holland, with nothing else around."

Today, most of those plantings are gone from what has come to be known as the Monet Garden. The Anginos had continued to plant the area, using willows, daylilies, and more rhododendrons, "with no idea what it would look like when we were done." Then, in the early 1980s, Alice became interested in the impressionistic painters, particularly Monet. "And we noticed that whenever we saw a picture of his water garden at Giverny, it looked incredibly like what had been our old farm pond. The position of the willows, the way the water comes down from the mountains. It was enough to make us believe that we had led multiple lives. All we had to do was put his green bridge in the northwest corner."

The second area the Anginos tackled was the area immediately around their home (see sidebar, page 40). As Angino read about more plants, "I was like a kid in a candy store. I wanted three of everything, and I wanted them everywhere. I think that was the biggest mistake I made in the past 25 years. I wanted continuous bloom—little bulbs, daffodils, azaleas, daylilies, butterfly bushes, anemones for fall color. Pretty soon it makes every area look like every other area."

A trip to Callaway Gardens in Georgia impressed him with the idea of "rooms" in a landscape, each designated for a single type of plant. "It was at that point I began to think of the property as a museum. I got dozens of catalogs and began trying to collect every variety of every species."

An opportunity to obtain mature rare conifers arose in 1979, when the collection of deceased Feasterville, Pennsylvania, nurseryman Fred Bergman was auctioned. The Anginos eventually bought about 10 percent of Bergman's 4,500 specimens. "We had about a 95 percent success rate transplanting them," he recalls, "which isn't bad considering that some of them had root balls weighing about a ton."

CHARLES W. BOWERS

COURTESY OF RICHARD ANGINO

CHARLES W. BOWERS

The Italian Gardens, above, have four levels and six pools, bottom right. In the 10 years since the top right photo was taken, Richard Angino has decided that less lawn means fewer chemicals in the well water as well as less mowing.

The Bergman collection became the major feature of a Japanese garden, across a service road from the front of the Angino home. "I didn't even get books on Japanese gardens early on," Angino says. "This was done by an amateur getting a feel for what he thought an Oriental garden should look like, working with a front-end loader in an old cow pasture." This past summer, the Japanese garden was redesigned, transplanting trees and shrubs originally planted too close together, so that specimens such as an elegant dragon's-eye pine could take more of a starring role. "When I initially put them in," he admits, "I didn't understand how important it was for the Japanese to be able to contemplate one item, or that they don't like garish colors, like blue or golden-colored conifers."

Helping him reshuffle the plants was David Wilson, whom he and Alice had met on an American Horticultural Society trip and hired in 1993. Wilson had managed a nursery in Ireland and hosted a gardening series for British television. The Anginos had reached the point where they needed help not only with the physical demands of the garden, but with guiding it into its more public phase. Wilson is a consummate plantsman and an entertaining tour guide who, like Alice, seems to bring a bit of yin to Angino's yang. Alice recently commented on her husband's patience level by observing, "He believes Rome could have been built in a day if he had been in charge."

Wilson laughs in recalling the frantic pace of the relandscaping. "Weather didn't allow us to do much until about the middle of June. We had to move rocks, lay paths, move 31 large trees, and excavate two old farm ponds to form a single pool, all by August 5 because we had a benefit scheduled."

Also involved with the redesign was Swarthmore, Pennsylvania, landscape architect Harriet Henderson, whose skill was brought to bear on a waterfall and bridge deemed out of scale. Not only does he have no patience, Angino agrees, but no interest in the hard forms of landscaping. "Harriet was fantastic. She seemed to spend hours thinking about where to put a single rock."

There is no doubt that the most unforgettable feature of the Angino Gardens is the Italian Gardens, which Henderson helped Angino design beginning in 1988. Its scope and style have caused AHS President Marc Cathey to compare Angino to epic movie producer Cecil B. De Mille. "You expect to hear the blare of trumpets and see thousands of extras streaming in," Cathey marvels. Still, for visitors whose bent is toward plants rather than architecture, this garden may not be everyone's favorite. Angino even had mixed feelings about it as he was building it.

"I really had to overcome a lot of my natural tendencies, that plants should be the main architectural features, for instance. I don't like yews or arbor-vitae because they're stilted and artificial plants. I don't like the way you have to prune" in Italian gardens. But he wanted to recognize his Italian heritage and, as he read, he realized he'd never seen a garden that traced garden history. Here on these four terraces, crowned by an amphitheater, is a reflection of 2,000 years of Italian gardening, from medieval to classical, through Renaissance, Islamic, and modern.

A much more personal garden, and one that is a favorite with visitors, is the Alpine Garden. Hearing Angino describe its creation conjures visions of him as the Impressionistic Gardener, creating a shape here and putting a bit of color there, with plants and a backhoe instead of paints and brush.

"It was a low area that I didn't know what to do with. We had heard that walnuts were valuable as a crop, and we had planted a couple hundred walnut whips...but they take forever to grow." So out came the walnuts. "I took a week off work, got a front-end loader, and mounded some soil in. And then I thought of what I'd read about the seven hills of Rome. I created a center mound that was tall and round like a volcano and then the foothills. And the great thing is that visitors have such a good view of the real foothills from here."

Angino thinks visitors are enchanted by the pygmy scale of the garden: Looking down from an adjacent rim, there is a sense of looking at much more distant vistas. "It gives you a Paul Bunyan feeling, with everything seeming to be in miniature, and the plants do wonderfully because of the drainage." And by descending into this "bowl," it's also possible to see eye-to-eye with the individual plants. The colors used here are also impressionistic, with less attention to bloom and more to foliage color, including the use of dwarf conifers, ground

covers, and yellow-leaved spirea.

The lawyer had always looked on his gardening as a sea of tranquility in his demanding work life. "I can get a shovel, jump on a tractor, and all that other life is gone." In 1986 and '87, when he was working on the Alpine Garden, the need to escape became imperative. His youngest son, Fred, was dying of leukemia. "Cancer is horrible not only for the person going through it," he says, "but also for everyone who cares about them. There were a lot of ups and downs, and when the news was bad, and especially when we knew there wasn't much time left, I threw myself into that particular garden."

Frederick Michael Angino died at 17, and benefits for his memorial fund were some of the first public functions at Felicita. His ashes are in a chapel on the grounds, which will become a family mausoleum; the garden is endowed so that it will be maintained after the Anginos die.

Over the next five to 10 years Angino hopes to do more naturalistic landscaping up the mountain, employing predominantly native plants. Again, there will be nothing on paper. Did Monet paint by number?

Angino is asked how the average gardener can relate to his mammoth undertaking. "Well, you know, a grand garden is really just a lot of little gardens. Our Japanese garden is only an acre. I get a lot of enjoyment from some of the most isolated features."

What his garden reflects, he says, isn't vision so much as hard work, "the kind that any avid gardener does—the ones who are really touched by the thing," driven by something inside.

Kathleen Fisher is the editor of American Horticulturist.

VISITING THE GARDENS

The Angino Gardens are open to small groups, by appointment, from April through September. Tours for groups of up to 15 people are $20 per person, with a minimum charge of $250. The terrain is somewhat steep, but arrangements can be made for special assistance. The gardens also offer "Garden Away Days," a day-long package of tours, lectures, and workshops, on Wednesdays and Saturdays. For more information, call (717) 599-5656.

A Front-Yard Makeover

After 25 years, any home garden begins to seem pretty ho-hum, and Richard and Alice Angino's front yard was no exception. Not that they hadn't done some things right the first time. "When we first moved in, there were just a few sumacs and other weedy things around," Richard recalls, "but I could picture where I wanted the driveway and what size plants I would want."

Unlike most beginning gardeners, he chose plants that didn't outgrow their space: blight-resistant crabapples that topped out at 12 feet, alongside the driveway, underplanted with azaleas and periwinkle *(Vinca minor)*, and two amur maples *(Acer tataricum* subsp. *ginnala)*. "I think that worked out rather nicely," he reflects.

But in the interim, the Anginos' tastes changed, the nature of their garden changed, and the concerns of gardeners in general changed.

Being adjacent to the Angino home makes this area—at 170 by 80 feet, comparable to the size of many suburban lots—one of the most personal on the property. But it had become highly public as well, flanked by the barn and offices from which curator David Wilson directs the grounds crew and coordinates tours, and fronting on a storage shed and service road.

It was mostly lawn. "From everything I had read, I'd concluded that lawns are too demanding, labor intensive, and chemical dependent," Angino says. "We really are living off the land out here in the country, and all the chemicals we use go right into the water table."

COURTESY OF RICHARD ANGINO

The land also sloped too much to mow easily. And although the entry to their Japanese garden is directly across the road, the path that led from the front door swung off to one side, leading down steps that were short of inviting.

BRENT BLAIR

Pink sandstone found on the mountain behind the property solved a number of problems. A close match to the bricks in the Angino house, it was used to build a combination retaining wall—eliminating the slope down from the former lawn area—and scree. A scree is a sloping rocky area most commonly used to display alpines, for which it can provide both the ideal sunny exposure and perfect drainage. But because visitors to the Angino Gardens expect to see something of interest year-round, Angino and Wilson chose a much wider variety of plants than is normally seen in an alpine garden. Wilson has a story to go along with most of them.

BRENT BLAIR

The front yard began as primarily turf, top. Last spring, planting beds were expanded, center, and a retaining wall–scree built to eliminate a slope and display unusual plants, bottom.

Among the conifers, for example, is *Chamaecyparis pisifera* 'Filifera Sungold', which grows slowly to 15 feet, shooting a mop of greenish yellow branches in all directions. "When I was working in the nursery," he says, "we used to call this one 'Tina Turner'" because it reminded them of the rock star's hair.

Just a few of the long-season performers here are *Sedum* 'Vera Jameson', named for a member of the Irish whiskey family, with mahogany spring growth and ruby flowers in August or September; the trademarked *Scabiosa* Butterfly Blue, a compact grower with blooms from May through November; *Campanula takesimana* from Korea, which generously repeats its white to lavender spring flowers; and the intensely colored 'Purple Dome' aster. Wilson says a

favorite with visitors is the donkey-tailed spurge *Euphorbia myrsinites,* certainly not for its little yellow-green bracts or even for its scaly silver foliage, but for its attention-getting seeds, which explode in the summer sun.

The pink sandstone was such a success along the front of the garden—it was originally planned for just one corner—that it was repeated in the steps descending toward the Japanese garden. "It wasn't easy to get flat rocks of just the right size," says Wilson, "so what you see above ground represents some considerably larger rocks that we dug holes for and buried until they were at the right level for the next step."

Wilson enthusiastically points out that the scree not only gives space to a huge array of sun-loving plants, from ground level to almost eye level, but that when viewed from the house or the driveway, the entire display disappears. From these angles, the sense is of being in a heavily wooded parkland.

Already giving the garden considerable structure were several cultivars of Japanese maple and one of Norway maple *(Acer platanoides* 'Schwedleri'), two blue spruce, and a large false cypress *(Chamaecyparis nootkatensis* 'Pendula'). Several 40-foot zelkovas flank the west side.

But more trees were needed: more evergreens to screen the outbuildings and road, and understory trees and shrubs to provide interest and help lighten the look of the area. As with the sandstone, it was often unnecessary to buy anything. After 25 years of collecting, an appropriate plant was more likely than not already on the property. From the Japanese garden, where some trees had been planted too close together, they moved in two 'Skylands' Oriental spruce and a weeping spruce, which will be trained to a narrower form to keep it in bounds. "We considered *Cryptomeria,*" says Wilson, "but we already had the Oriental spruce and they give us a brighter, golden color."

In another recycling maneuver, a magnolia *(Magnolia kobus* var. *loebneri* 'Merrill'), more than 20 feet tall with a six-foot root ball, was transplanted from the Angino and Rovner law offices, where it was in the way of an expansion. Several hollies *(Ilex opaca* and *I. vomitoria)* and a Korean fir (also moved from the law firm where the tree was competing with other plants) in the southwest corner provide additional privacy.

For the understory, Wilson and the Anginos chose many plants with pale flowers or variegated foliage, including two Shasta daisy cultivars—the six-inch-tall 'Snow Cap' and the variegated 'Barbara Bush'—and a cultivar of black cohosh, *Cimicifuga racemosa* 'Atropurpurea', which has slightly bronze foliage and white flowers. Among the shrubs are *Hydrangea paniculata, Enkianthus,* pink-flowered rhododendrons, and sweetspire *(Itea virginica* 'Henry's Garnet'). In the expanded center bed is a dogwood called "the wedding cake tree," *Cornus controversa* 'Variegata'. "As it grows—slowly, to about 15 to 20 feet—its limbs will form distinct layers that seem to be frosted," says Wilson.

Herbaceous perennials continue the theme of pink, blue, or white flowers or variegated foliage: variegated Solomon's seal, tiarella, *Carex oshimensis* 'Evergold', and the variegated *Iris pallida*—"for its spiky shape," Wilson says of the latter. "It only blooms for two and a half weeks." A pulmonaria cultivar, 'Spilled Milk', has wide splashes of white on its foliage, rather than the polka dots seen on older varieties. "Its flowers aren't especially outstanding," says Wilson. "For that we grow another pulmonaria, 'Pierre's Pink'."

He points out the cyclamen—ivy-leafed *Cyclamen hederifolium* and both the pink and white forms of *C. coum*—flourishing in dry shade, and the "springs" formed by the flower stalk after the flower has fallen off. "They can form corms as big as a saucer and will reseed prolifically," Wilson says. "But people should be sure to buy seeds or pot-grown corms." Dry corms are usually wild-collected, and not only deplete native stands, "they probably won't come up."

Scheduled for attention next is a small area immediately in front of the house, which Angino hopes to revamp to echo some of the same themes, but on a more intimate scale. "I think it will lend itself to some of those jewels that are so new and so expensive that you can't buy them in quantity—the first white of this, the first black of that."

—Kathleen Fisher

PHOTOGRAPHS BY BRENT BLAIR

Among the plants displayed along the retaining wall are* Scabiosa *'Butterfly Blue', top, here unfurling its petals, and* Geranium *'Ballerina', above. Steps, center photos, were realigned to lead toward the Japanese garden across the road and rebuilt from the same stone used for the retaining wall.

Not Your Father's Hazelnut

A retired Oldsmobile worker is trying to crack the West Coast monopoly on commercial nut growing.

COURTESY OF GRINNELL NURSERY

Cecil Farris inspects a hazelnut during a field check at Grinnell Nursery, which sells his trees.

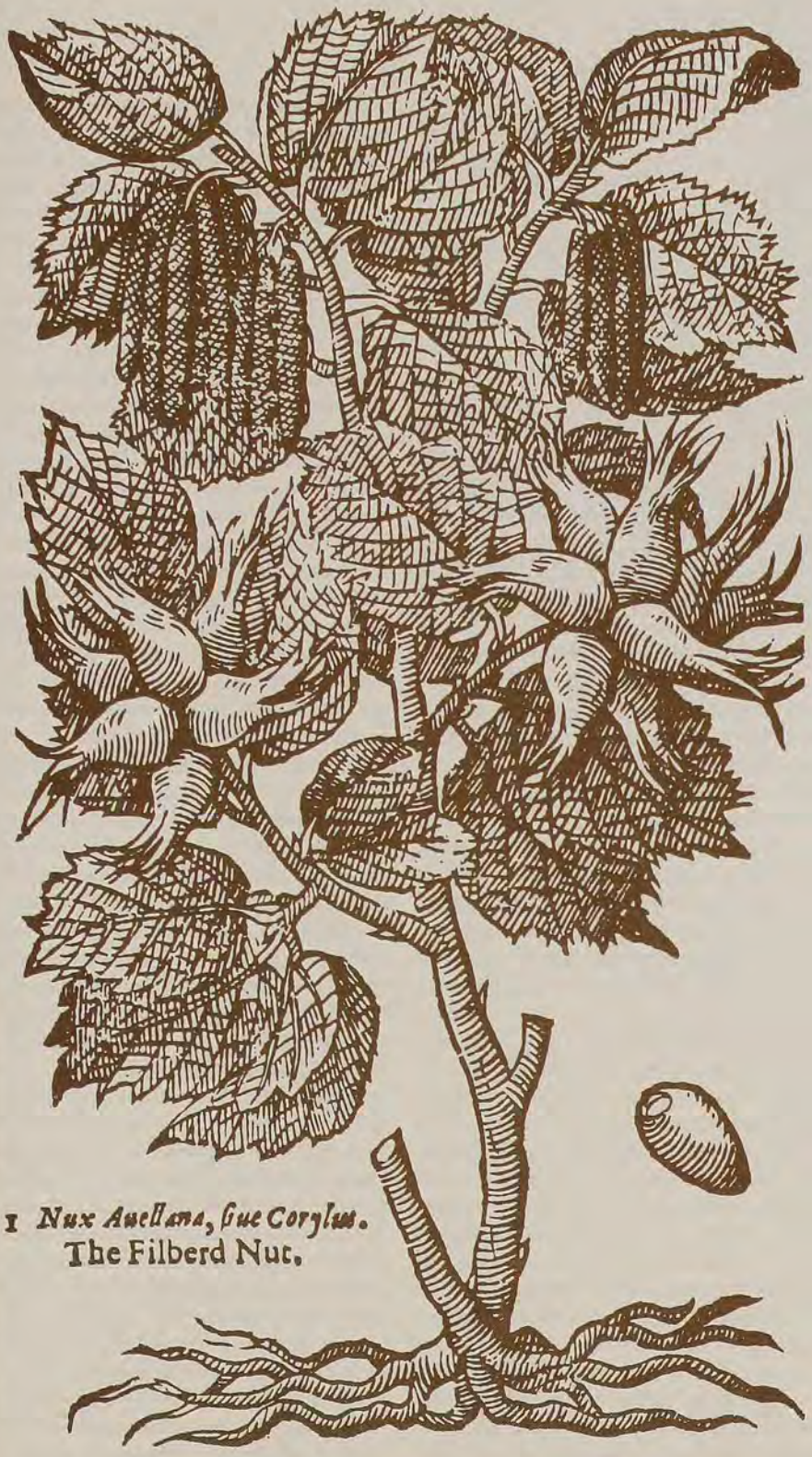
BY KIMBERLY WYNN

Cecil Farris isn't quite sure how many hazelnut varieties are growing in his back yard, since one tree alone has more than 20 types grafted to its limbs. This suburban Michigan property has only a quarter-acre of green space, but it holds the progenitors of a growing industry. Prior to 1990, not a single commercial hazelnut tree was grown in this state. Now there are nearly 200 acres of them, 98 percent of which had their start in Farris's yard. The reason it's not 100 percent, he explains, "is because hazelnuts are generally self-sterile and need to be planted with another variety" that serves as a pollinator.

A retired tool-and-die maker for Oldsmobile, Farris has devoted much of the last 35 years to breeding hazelnut and walnut trees that are both disease resistant and hardy enough to be grown in the upper Midwest. In 1991, the year he retired from Oldsmobile, Farris received the Northern Nut Growers Association Merit Award in recognition of his contributions to the advancement of nut tree culture in America.

Hazelnuts belong to the genus *Corylus* in Betulaceae or the birch family, which also includes birch, alder, hornbeam, and hop hornbeam or ironwood. In the western United States they are more commonly called filberts, the name made official by the 1942 revision of *Standardized Plant Names* by the American Joint Committee on Horticultural Nomenclature. Worldwide, nine species are commonly recognized, along with several subspecies, varieties, and hybrids. Two species are native to North America: the American filbert, *Corylus americana,* which is primarily an Eastern tree, and the beaked filbert, *C. cornuta,* which ranges from coast to coast and from Alabama north to Saskatchewan. Our native trees yield small nuts encased in thick shells and are highly susceptible to a pest called the filbert bud mite. A European species, *C. avellana*—called the edible or European filbert—and its cultivars are most commonly cultivated for a commercial crop.

"Hazelnuts were never very successful in America," says Farris. "The culprit was a fungal disease that lives in the bark of native hazel trees." The fungus, *Anisogramma anomala,* commonly called Eastern filbert blight, isn't fatal to native American trees, but it's devastating to the European varieties. In the late 1800s, however, it was recognized that imported filberts would flourish in the mild climate of our Pacific Northwest, which also proved



FROM THE HERBALL OR GENERALL HISTORIE OF PLANTES BY JOHN GERARD

to be blight free. A decade ago Oregon's Willamette Valley, and to a much smaller extent, Washington State, were supplying nearly half of the American demand for filberts. But today growers in these states are reeling from filbert blight, which despite careful regulation has slowly crept in from other parts of the country.

Farris believes that the Northwest monopoly on commercial hazelnut growing could be broken by his 1989 introduction, 'Grand Traverse'. Named for Minnesota's Grand Traverse Bay, where it was first planted out, the cultivar is both blight free and cold hardy into the northern part of the state. That's in USDA Zone 4, although Farris doesn't claim a hardiness rating for it.

A Tennessee native who found that this colder state offered more job opportunities, Farris traces his interest in nut trees to 1959. That was the year he built a new home in Lansing, where he and his wife, Jean, would raise four children. As a new homeowner, Farris was eager to begin landscaping, and he went to the library to learn more about planting trees and shrubs. When he came across a copy of *The Improved Nut Trees of North America and How to Grow Them* by C. A. Reed and John Davidson, he was fascinated. "When I bought walnuts at the store for Christmas as a child, I always thought of them as something exotic. I didn't realize we could grow them here," he says. When he wrote to a plant source listed in the book, he was referred to the Northern Nut Growers Association, an organization for both amateurs and professionals interested in developing improved nut trees. Before long he was collecting seeds and cuttings from around the world and making his own controlled crosses.

"It was something to do that didn't require much time at first," he says. "Everyone should be an expert on something, no matter how mundane." But it wasn't long before Farris's back yard and basement began to fill with seedlings and grafted trees. Indoors, he works in two widely separated rooms to avoid the danger of cross-pollination. He has amassed a small library on genetics and has traveled as far away as Manchuria, where he was able to speak to one leading hazelnut grower only through the translation of the man's wife, a professor of English.

Along the way Farris benefited from the advice of many people, among them Harry Lagerstedt, who was a research horticulturist with the U.S. Department of Agriculture at Oregon State University (OSU) when Farris first began communicating with him in 1971. At the time, OSU had just begun an ambitious hazelnut breeding program under the direction of Maxine Thompson. Farris and Lagerstedt's common interest in nut breeding led to a lasting friendship and mutual admiration. "Cecil carries on a voluminous correspondence with people in many lands in his quest for knowledge and plant germplasm, and in generously sharing those commodities," says Lagerstedt, who is now retired.

Lagerstedt wrote the filbert chapter in a 1979 book, *Nut Tree Culture in North America,* edited by Richard A. Jaynes, in which he notes that Farris was the first filbert breeder to cross the edible hazelnut with the Turkish hazelnut, *C. colurna,* which has a different number of chromo-

somes than any of the other species. According to Lagerstedt, Farris's accomplishments are particularly impressive for an amateur. "It is unusual for someone without formal training in horticulture, without technical assistance, and without extensive use of land or supplemental labor, to have the stick-to-itiveness to devote over 30 years to collecting and breeding nut trees," he says. "He is an accomplished plant propagator and pollen handler. Most importantly, he is a keen observer, which is so essential in recognizing and recording numerous plant characteristics."

Lagerstedt adds that Farris has developed valuable germplasm for other breeders, many of whom have visited Lansing and benefited from the amateur's efforts. Farris, in turn, credits Lagerstedt for his continuing support and advice. "He's sent me reams of photocopied information that I still read," says Farris. "He supplied ideas and some plant material that helped begin a walnut breeding program that is just now proving to be a success. He was not easily impressed, and that gave even more weight to his critical judgments."

Ironically, Lagerstedt originally tried to discourage Farris from spreading himself too thin by working on more than one type of nut tree. But Farris is determined to introduce a winter-hardy English walnut to the eastern United States and thinks he may be on the right track.

Because of their preference for a Mediterranean climate, English or Persian walnuts *(Juglans regia)*—the latter more accurately indicates their native habitat—are currently grown as a commercial nut crop only on our West Coast. Useful also for furniture making and as shade trees, they were planted in the eastern United States in Colonial times, and some of these ancient trees still exist as huge monoliths, seemingly immortal. But periods of winter thaw followed by spring frosts too often kill the terminal buds that would produce a crop of any size.

In the late 1920s and early 1930s, a Presbyterian minister, Paul C. Crath, who had immigrated to Canada from Poland, arranged the introduction to this continent of Persian walnut trees that had adapted to the challenging climate of the Carpathian Mountains of eastern central Europe. The Carpathian walnuts were extremely cold tolerant, surviving temperatures to 30 degrees below zero. Even so, the damage to new growth by late frosts remained a barrier to commercial production in the East and Midwest.

According to Farris, the perfect walnut must not only be cold hardy, but have light-colored, tasty meat and a shell that's thin but strong enough to withstand mechanical processing. The shell should be smooth and rounded, without a pronounced ridge at the suture where the two halves are joined.

In 1987 Farris developed the genetically diverse 'Kaiser' walnut, which he believes may carry the genetic characteristics needed for Midwestern growers to challenge California's dominance of the walnut industry. From a 'Spurgeon' walnut from the Oregon State program, it acquired the ability to leaf out later in spring, making it more resistant to late frosts. From Russian walnuts, it inherited precociousness and a faculty for lateral fruition, meaning that it will begin bearing at an early age and that both new and old growth buds can produce nuts. And from Chinese walnuts, it inherited the ability to withstand cold winters. "Most of the new breeding material now being acquired is from China," says Farris, who notes, "The Chinese have been growing walnuts for 2,000 years."

The toughness of the 'Kaiser' shell led to its name. Farris had to use needle-nosed pliers to remove the shells of the first nuts produced in the breeding program. "One could say that all of these trees resulted from cesarean births," he says. "I would like to have named the group Caesar, but the name had already been used on a walnut. So I decided to name the group 'Kaiser', which is the German equivalent of Caesar."

Farris is quick to point out that 'Kaiser' still needs improving, and in fact has already been improved so much he's considering cutting down the original tree. "I have some seedlings that have bloomed at one year! I didn't believe it was possible myself."

In recognizing people who've helped him along the way, Farris gives first place to his wife, Jean, "who has had to listen to every idea in disgusting detail." But even wives have their limits. Farris realized that his bench grafting was becoming a bit disruptive because he needed to heat the laundry room to 82 degrees and close it off for six weeks at a time. So he began to turn much of that grafting responsibility over to Sid Grinnell, owner of Grinnell Nursery in nearby Perry, Michigan.

Grinnell, a former Oldsmobile co-worker who took Farris's position when Farris retired, is also his protégé in the world of nut-growing. Farris introduced him to the hobby and in 1984 made a formal arrangement by which Grinnell would grow and

FROM GERARD'S *HERBALL*

sell his trees. Six years ago, Grinnell says, he sold 400 trees. Last year he sold 18,000, to buyers as far north as Canada, as far south as Tennessee, and as far away as New Zealand and Germany. Says Farris, "At first I was the teacher, but that arrangement has been slowly reversed. His success as a nurseryman has made me proud."

Once Farris has a seedling that he considers successful, Grinnell uses a technique he developed to graft the new hybrid onto a hardy rootstock. By pretreating both the rootstock and the scion wood, and growing the graft in chambers where the atmosphere is high in carbon dioxide, he says he's achieved a 90 percent success rate. The resulting trees, he adds, have deeper roots and greater resistance to drought than trees grown on their own roots. In addition, grafted trees don't form suckers, eliminating the need for herbicide applications or time-consuming pruning.

Nor do Farris's trees need pesticides, according to Grinnell. "Cecil is very meticulous in what he breeds," the grower says. "He's eliminated a lot of the diseases and insects. He gets rid of the problems people are spraying for."

David Amon, the first Michigan farmer to plant Farris hazelnuts for commercial produce, says that during the winter of 1994 the temperature at his orchards near Traverse City fell to 32 degrees below zero. He lost some apple, peach, and cherry trees, but the hazelnuts were undamaged. "That was one of the tests we were looking for," he says. "It is phenomenal what Cecil has done."

Eight years ago Farris had the opportunity to take some of his cherished hazelnuts south to his native Tennessee, where his daughter had bought a house in Franklin. He was pessimistic about the chances of his northern-bred nuts thriving there, so along with the freshly dug, three- to five-foot trees he hauled more than 100 pounds of finished, sifted compost to amend Franklin's red clay. To that he added sawdust, soaked with a gallon of soluble fertilizer for nitrogen. The trees were mulched with lawn clippings and irrigated regularly. But filberts do best in clean cultivation—with no competition from grass or other plants—and these were interplanted with peppers, tomatoes, and ornamentals.

In August 1990 he visited for the first time in a year. The weather in Tennessee had ranged close to 100 degrees for almost a month, and he mentally prepared for dead trees. Instead, they had started to bear and were luxuriant. Some were eight feet tall. New shoot growth of three feet was common, and the trunks had tripled and quadrupled in diameter since planting. The leaves were a darker green and half again as large as the same varieties growing in Michigan. 'Grand Traverse', whose nuts normally mature in late September in Michigan, dropped unusually large, well-developed ripe nuts in Tennessee on August 30.

Grinnell thinks the time is right for the entry of a Midwestern hazelnut into the marketplace. "California is getting low on water," he says. "Oregon is battling a blight problem now, and a lot of farmers are looking to diversity." Amon, the Traverse City orchardist, started growing the hardy filberts for just that reason, adding 400 of the Farris cultivars to his peach, cherry, and apple trees. "We have a very large retail operation with catalog orders," he says, "and we wanted more diversification."

Farris says that with production costs rising in California, where land costs four to five times that of farmland in the Midwest, the walnut industry could shift eastward as well. "It is likely that the 'Kaiser' walnuts will be well adapted to the area from southern Indiana and Illinois to the southern limit of the Piedmont plateau in Alabama and Georgia," he says. "If the trend of rising production costs of walnuts in California continues, the entire industry may shift to the Midwest and Southeast."

And that's where Farris and his new generation of nut trees will be waiting.

Kimberly Wynn is a free-lance writer based in Rockford, Michigan.

COURTESY OF GRINNELL NURSERY

KIMBERLY WYNN

Farris's 'Grand Traverse' hazelnut, top, is blight free and hardy in northern Michigan. Extensive grafting allows this single tree in the Farris back yard, above, to bear more than 20 types of hazelnuts.

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A. tataricum **subsp.** *ginnala* A. tuh-TAR-ih-kum subsp. jih-NAY-luh
Aesculus glabra ES-kyew-lus GLAB-ruh
Butia capitata BEW-tee-uh kap-ih-TAY-tuh
Buxus microphylla **var.** *japonica* BUCKS-us my-kro-FIL-luh var. jah-PON-ih-kuh
B. sempervirens B. sem-pur-VY-renz
B. sinica **var.** *insularis* B. SIH-nih-kuh var. in-sue-LAIR-iss
Campanula takesimana kam-PAN-yew-luh tah-kee-see-MAN-uh
Carex oshimensis KAIR-eks o-she-MEN-sis
Centaurea montana sen-TAW-ree-uh mon-TAN-uh
Chamaecyparis nootkatensis kam-eh-SIP-uh-riss noot-kuh-TEN-sis
C. pisifera C. pih-SIF-er-uh
Chamaedorea elegans kam-eh-DOR-ee-uh EL-ih-ganz
C. microspadix C. my-kro-SPAY-diks
C. radicalis C. rad-ih-KAL-is
C. seifrizii C. see-FRIZ-zee-eye
Chamaerops humilis kah-MEE-rops HEW-mih-lys
Cimicifuga racemosa sih-mih-SIF-yew-guh ras-eh-MO-suh
Cornus controversa KOR-nus kon-tro-VER-suh
Corylus americana KOR-ih- lus uh-mair-ih-KAN-uh
C. avellana C. ah-vel-LAN-uh
C. colurna C. kol-UR-nuh
C. cornuta C. kor-NEW-tuh
Cryptomeria krip-toh-MAIR-ee-uh
Cyclamen hederifolium SIGH-kluh-men hed-er-ih-FO-lee-um
C. coum C. KOOM
Enkianthus en-kee-AN-thus
Euphorbia myrsinites yew-FOR-bee-uh meer-sin-EYE-teez
Fraxinus pennsylvanica frak-SIH-nus pen-sil-VAN-ih-kuh
Hesperis matronalis HES-pur-iss mah-tro-NAY-liss
Hydrangea paniculata high-DRAN-juh pan-ik-yew-LAY-tuh
Hypericum calycinum high-PAIR-ih-kum kal-ih-SIGH-num
Ilex aquifolium EYE-leks ah-kwi-FO-lee-um
I. opaca I. o-PAK-uh
I. vomitoria I. vom-ih-TOR-ee-uh
Iris pallida EYE-ris PAL-lih-duh
Itea virginica eye-TEE-uh vir-JIN-ih-kuh
Juglans regia JEW-glanz REE-gee-uh
Magnolia kobus **var.** *loebneri* mag-NOLE-yuh KO-bus var. LOBE-ner-eye
Malus coronaria MAL-us kor-o-NAIR-ee-uh
M. floribunda M. flor-ih-BUN-duh
M. ioensis M. eye-o-EN-siss
M. ×zumi M. × ZOO-me
Primula veris PRIM-yew-luh VAIR-iss
Rhapidophyllum hystrix ruh-pid-oh-FIL-um HISS-triks
Sabal minor SAY-bul MY-nor
Scabiosa skay-bee-O-suh
Sedum SEE-dum
Serenoa repens sair-eh-NO-uh REP-enz
Trachycarpus fortunei trak-ee-KAR-pus for-TEW-nee-eye
Vinca minor VING-kuh MY-nor
Viola odorata VY-o-luh o-doh-RAY-tuh
Viola odorata **var.** *rosea* V. o-doh-RAY-tuh var. ro-ZAY-uh
Washingtonia filifera wash-ing-TOH-nee-uh fih-LIF-ur-uh
W. robusta W. ro-BUS-tuh

STUDY TOURS

TRAVEL/STUDY TRIPS FOR THE AHS GARDENER

MAY 7-21, 1996
GARDENS AND WILDFLOWERS OF GREECE AND TURKEY

MAY 21-25, 1996
LONDON EXTENSION FOR ROYAL CHELSEA FLOWER SHOW

May is the ideal time for visiting this part of the Mediterranean. The countryside is bright with the flush of colors from gardens and wildflowers. This Travel/Study Program begins with a three-night stay in Athens, followed by a seven-night voyage on board the elegant sailing ship *Wind Spirit* and a three-night stay in Istanbul. Ports of call in the Aegean Sea will include the Greek islands of Mykonos, Santorini, and Rhodes, as well as the Turkish cities of Bodrum and Kusadasi. The *Wind Spirit* has expansive teak decks for sunning and for alfresco dining, as well as 74 cabins with every conceivable comfort. The optional extension to London includes membership in the Royal Horticultural Society and Members' Day tickets to the Royal Chelsea Flower Show. Visits to exceptional gardens, sightseeing, and theater performances are also included. Leading this program will be AHS Board member Robert D. Volk and his wife, Carolyn, of San Marino, California.

ALSO PLANNED FOR 1996:

JUNE 2-11, 1996 • GARDENS OF BELGIUM

JULY 17-21, 1996 • GARDENS OF NANTUCKET

AUGUST 12-24, 1996 • GARDENS OF SCOTLAND AND THE HEBRIDES

SEPTEMBER 12-21, 1996 • GARDENS OF PROVENCE

OCTOBER 14-25, 1996 • GARDENS OF TUSCANY

OCTOBER 29-NOVEMBER 3, 1996 • GARDENS OF SOUTHERN CALIFORNIA

Leonard Haertter Travel Company, 7922 Bonhomme Avenue, St. Louis, MO 63105, (800) 942-6666, (314) 721-6200 (in Missouri)

AHS members will visit the Acropolis in Athens, Greece, as part of the May travel/study trip to the Mediterranean.

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