

American Horticulturist

February 1991

A Publication of the American Horticultural Society

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Experience the grandeur of the Mississippi from New Orleans to Memphis on board the *Mississippi Queen*. Ports of call along the river include Houmas House, Saint Francisville, Natchez, Vicksburg, and Greenville. Experience true Southern hospitality as AHS members and friends along the river open their homes and gardens for this horticultural adventure.

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MAY 12-23, 1991 ENGLISH COUNTRYSIDE GARDENS AND THE CHELSEA FLOWER SHOW

AHS members will have the unique opportunity to meet horticultural author Rosemary Verey and visit her home and garden—Barnsley House—during this visit to the rolling hills of the Cotswolds and Kent. Participants will visit the gardens of Hidcote Manor, Sudeley Castle, Oxford, Denmans near Arundel, Nymans Gardens, Wakehurst Place, Great Dixter, Sissinghurst Place, and Isabella Plantation before transferring to London to enjoy the Chelsea Flower Show. Guest lecturer for this program is David Wilson, popular panelist on the BBC's series, "Gardener's Corner." The tour will be led by Elvin McDonald, lecturer and author and Secretary of the AHS Board of Directors.

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JUNE 10-20, 1991 GARDENS OF THE SOUTHWEST: COLORADO ROCKIES AND CANYONLANDS

Explore the diverse contrasts of plants from the alpine meadows of the Colorado Rockies to the desert plains of the Southwest. Explore unique, out-of-the-way parks like Arches National Park, the Goosenecks of the San Juan River and Canyon De Chelley National Monument. See firsthand the varied uses of native plants as AHS members and friends open their gardens and homes for our special visit.

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AUGUST 14-27, 1991 GARDENS OF THE MEDITERRANEAN

Cruise aboard Sun Line's yachtlike *Stella Maris* along the northern coast of the Mediterranean Sea from Nice to Venice. En route we visit magnificent private and public gardens of France, Italy, and Yugoslavia as well as the wildflower meadows among ancient ruins and botanical gardens in Greece. The itinerary includes two nights in Nice and three nights in Venice as well as calling at the ports of Portofino, Elba, Sorrento, and Messina, Italy; Katakalon and Corfu, Greece; and Dubrovnik, Yugoslavia. The BBC's David Wilson will be guest lecturer for this memorable summer tour.

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Hidcote Manor Gardens, in the Cotswolds, are among gardens to be visited during an AHS Study Tour next May.

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American Horticulturist

Volume 70, Number 2

February 1991

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The long summer daylight almost makes up for the ice and snow.

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FEBRUARY'S COVER

Photographed by Alec Pridgeon

Encyclia cordigera is a Latin American orchid with chocolate brown sepals and petals and a contrasting cream or rose lip. Like most of the *Encyclia* species, it is remarkably fragrant. It is among the orchids named by Alec Pridgeon, education director of the American Orchid Society, as "proven performers." Members of the American Bamboo Society and the American Begonia Society also name their favorites in an article beginning on page 26.

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American Horticultural Society

The American Horticultural Society seeks to promote and recognize excellence in horticulture across America.

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COMMENTARY

Horticulturists measure progress through growth—each new bud, leaf, or tendril reflects the progress and promise of the future. The American Horticultural Society is pleased to welcome twelve groups that have helped us grow by joining the Society through our Affiliate Membership Program. These special arrangements permit individuals to become members of AHS through their membership in local botanical societies or horticultural interest groups. These first groups joining us in 1991 represent some 5,000 individuals around the United States. We look forward to reflecting their activities and interests in our publications and coordinating their needs and interests with the programs of AHS throughout the country. It is our hope that many other plant societies and state and local horticultural groups will join us through this new program, thus helping to integrate and strengthen the field of horticulture across America. (These first affiliates are listed on page 6.)



One of AHS's major goals is to support and promote the many varied horticultural endeavors taking place throughout the United States. The size and incredible diversity of climates, soils, and other growing conditions, as well as cultural diversity in the United States, make our horticultural heritage vast and exciting. One means of bringing the work of these many specialty groups to a national focus is our February feature called "Proven Performers"—those plants named by several of the nation's approximately 200 plant societies as the most rewarding and, as much as possible, appropriate to all parts of the nation. This year, we are privileged to have reports from the American orchid, begonia, and bamboo societies—all of which hope to convert you to their passion for these particular plants. We know the choices will fascinate you. We also give you a behind-the-scenes glimpse of some of the important work being done by the New England Wild Flower Society in preserving and promoting the native plants of the Northeast, and a firsthand look at the challenges of gardening in our "high north" state, Alaska.

American horticulturists are committed and devoted, busily pursuing their vocations and avocations in thousands of different arenas. Our President, George Ball Jr., has said that there is no American horticulture, that the heterogeneity of the United States precludes a single definition of the field for this country. However, the experience of horticulture in America and its sense of value is common to us all. We encourage you to continue in your work and to join us as individuals and through specialty groups to continue to foster and publicize the many significant, worthwhile projects that are underway.

Horticulture in America is often too invisible, too quiet. Its impact on the nation's future health will be significant. We hope that you will help us to carry that message forward and, as an individual or through another group, you will join our growing ranks.

Frank Robinson
AHS Executive Director

45th Williamsburg GARDEN SYMPOSIUM

April 7-10, 1991

Colonial Williamsburg and the American Horticultural Society invite you to spend four spring days in Williamsburg attending the 45th Garden Symposium. Come and talk flowers amid the special colors and bouquets of dogwood, redbud, tulips, and other favorites of the season.

The theme of the symposium, "Garden Earth," will remind us of the very fragile environment that we all share. As gardeners we have special opportunities—and obligations—to make certain we utilize the soundest methods for protecting plant species, conserving water, and beautifying the earth by planting our own gardens while supporting high quality public landscaping in our many communities. In his keynote address, U.S. Assistant Secretary of Agriculture Charles Hess will describe the federal government's program for the environment. Added to the informative presentations of a knowledgeable panel of speakers will be tours, exhibits, and clinics. San Francisco will be the honored city, and journalist-lecturer Joan Hockaday will present an illustrated talk about her city entitled "Garden-making by the Sea: The Gardens of San Francisco from Gold Rush to Thomas Church."

Speakers in order of appearance are:

The Honorable Charles Hess, U.S. assistant secretary of agriculture: "Enhancing Garden Earth Through Science and Education."

Neil Diboll, plant ecologist and nurseryman, Westfield, Wisconsin: "Prairies and Meadows: The Ecological Gardens of Yesterday and Tomorrow."

Patricia Gibbs, Colonial Williamsburg historian, and *Vanessa Patrick*, Colonial Williamsburg architectural historian: "The Plantation Gardens of Masters and Slaves at Carter's Grove."

Joan Hockaday, journalist and lecturer, San Francisco, California: "Garden-making by the Sea: The Gardens of San Francisco from Gold Rush to Thomas Church."

Jane Campbell Symmes, Cedar Lane Farm, Madison, Georgia: "Using Native Plants in Your Garden."

Roger B. Swain, science editor of *Horticulture* magazine and a host of PBS's "The Victory Garden": "Bugs, Birds, and Beas-



ties: Getting a New Grip on Wildlife in the Garden."

Kenn Stephens, president, International Design Symposium, Ltd., Westwood, Massachusetts: "Flower Parade: The Color and Style of Flower Arranging Artistry in the Americas."

Wesley A. Greene, landscape supervisor, Colonial Williamsburg: "Fronds and Neighbors: Native Ferns for the Home Landscape."

Douglas E. Welsh, president, National Xeriscape Council: "Xeriscaping: Water Conservation Through Creative Landscaping."

Warren Schultz, editor-in-chief, *National Gardening* magazine: "Glasnost in the Garden: An American Visit to Soviet Gardens." (Closing luncheon)

Call a friend and plan to come to Williamsburg on April 7. Feast your eyes on a cornucopia of horticultural delights and take home a satchel of new ideas. For a

registration folder, please mail coupon below to Symposium Registrar, Box C, Williamsburg, VA 23187, or call (804) 220-7255.

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AHS Affiliates

Members of the following institutions are participants in AHS's Affiliate Membership Program, a new networking opportunity available to most botanical gardens, plant societies, and horticultural groups.

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Westville, Illinois
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Lincoln, Nebraska
Texas State Horticultural Society
College Station, Texas
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Friends of Horticulture
Wellesley, Massachusetts



LETTERS



Pat Posey's perennial collection includes a new rock garden.

AHS MEMBERSHIP SERVICES

Your satisfaction with our member service is very important to us. If you have a question or problem concerning your membership, please contact the Membership Department for assistance.

You can help by giving complete information when you call or write. Please refer to the five-digit number that is on the mailing label on your magazine or News Edition. The number helps us to quickly identify your membership record for corrections.

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A Lot on a Little Lot

It was Carol Baker's letter in the October issue that sparked this letter. We have many things in common: gardens that are the same size (although mine is in an urban area), and climates that are almost identical.

Many of my perennials were started from seeds from our Society's annual Seed Program and they have flourished and multiplied. I share plants with anyone who wants them. I also adore working with my two grandchildren—Sam, 9, and Hannah, 5—who both started gardening with me at age 3.

Like Carol, I'm sending photos of my garden, and a clipping from our local paper featuring my garden.

Patricia J. Posey
Toledo, Ohio

From the article in the Toledo Blade, we learned that Pat Posey has 149 perennials in her 55-by-150-foot yard, in addition to berries and vegetables. We're pleased that she mentioned her membership in the American Horticultural Society to

"Greenscape" columnist Budd Gauger!

Although we cringe a bit at the possibility that all 20,000-plus of our members will send in garden photos at the same time, we love hearing about who our members are: what they grow, how they grow it, and above all, how we can help them become even better gardeners.

A Long History at AHS

Thank you for reminding me that my membership in the Society has expired. I was 86 in November, but still enjoy my lifetime interest in horticulture. I read several gardening magazines and the publications of plant societies to which I belong, but have felt that something was missing during the past year. Of course it was the beautiful AHS publication.

While your records may not show it, I have actually been a member of the Society since 1946, when I joined after returning home from four years of infantry service in World War II. Our Society was much smaller in those days, but was filled with dedicated gardeners. I believe the produc-

tion of the quarterly magazine and maintenance of the Washington office were handled almost entirely by B. Y. Morrison and a nice lady named Grace Wilson, who acted as Secretary-Treasurer.

During the 1940s I had become fascinated by some neglected bulb flowers called *Lycoris*. Ben Morrison was also interested in this genus, and he used to send me bulbs for trial that he had acquired through his work with the Plant Introduction and Exploration Division of the Bureau of Plant Industry (now the Agricultural Research Service). With additional help from gardener friends in Japan and from National Arboretum botanists who explored in that country, I eventually assembled the most complete collection of *Lycoris* species in this country and started hybridizing them. Ben used my photographs and story about them to fill over thirty pages of the April 1962 issue of the *American Horticultural Magazine*.

You can understand why I want to reactivate my AHS membership.

Sam Caldwell
Nashville, Tennessee

And we're glad you did. We're proud of our long history and would hate to lose such a long-time friend! Thanks for sharing your memories.

More on Pyracantha

The photo of the *Pyracantha koidzumii* on the cover of the October issue is impressive. I understand that the cultivar 'Victory' is hardy to Zone 7 at best, if kept out of wind in winter. Could you give readers more information about it?

Phin Tuthill
Newtown, Pennsylvania

P. koidzumii is reliably hardy only to Zone 8. But it is extremely drought tolerant, and attractive both in late April and early May, when it is covered with one-quarter-inch white flowers, and in September and October, when it fruits heavily. It requires a lot of pruning, and is susceptible to fireblight, lacebug, scale, and leafrollers. 'Victory' is hardy to Zone 7, grows vigorously to ten feet or more with an upright, arching habit. P. coccinea would be a better choice for Pennsylvanians. Some of its cultivars are hardy to Zone 5.

American Horticulturist welcomes letters concerning the magazine or activities of the American Horticultural Society. Letters may be edited for accuracy, clarity, or length. In writing to us, please include a daytime phone number.



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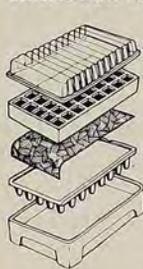
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GARDENING

by Hazel Weihe

Drought Insurance

Droughts...severe winds...not enough rainfall...what's a plant to do?

Our pets found spots in the shade during last summer's heat. Plants can't lie in the shade unless they're planted there and they can't go in for a cool shower unless you give it to them with a hose. But you can help them get through a long hot summer by using an anti-transpirant called Wilt-Pruf.

Think of the plant as inhaling and exhaling. When a plant inhales, it takes water in through its roots. When it exhales, it gives off moisture through its leaves. There are tiny pores in the leaves that give off this moisture. If the supply of water to the roots is too low, leaves become limp because they continue to emit moisture. In the process, leaves curl, become brown and desiccated. This is because they're giving off more moisture than the plant is absorbing.

What an anti-transpirant does is hold a balance between water taken in and moisture given off. Wilt-Pruf can sometimes make the difference between saving a growing tree or shrub and losing it.

An anti-transpirant is especially helpful when transplanting a small tree or shrub. No matter how careful a person is, the plant's root system is disturbed and some roots are lost. Wilt-Pruf has helped my transplants retain additional moisture after transplanting. Transplants need to be watered heavily to get them over the shock of having been dug. My plants have indicated by their behavior (they haven't died!) that Wilt-Pruf has been a definite help to them in surviving their trauma.

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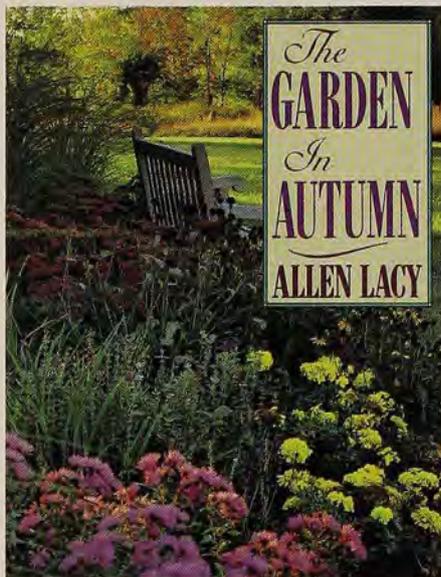
Hazel Weihe of Somers, New York, is an award-winning writer whose garden column is syndicated by The North County News.

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BOOK REVIEWS



The Garden in Autumn

Allen Lacy. Atlantic Monthly Press, New York, 1990. 230 pages. Color photographs. Publisher's price, hardcover: \$29.95. AHS member price: \$25.45.

Allen Lacy, one of this nation's best philosophical garden writers, at last brings us a lyric celebration of a season that has been generally overlooked or otherwise treated as merely the end of the gardening calendar.

Lacy begins his departure from traditional thinking with his own rediscovery of autumn's pleasures and promise. Autumn chores are indeed less arduous than those of summer's dog days: cool days free us to divide our perennials, transplant woody plants and shrubs, and weed without instant reprisal.

Lacy beckons us beyond this "lull among weeds" with a magnificent multi-chapter inventory (with sources) of plants. This varied palette grew out of Lacy's observations in his southern New Jersey garden of a plant here, another there, whose prolonged blooms continued to accent his garden well into late fall and winter.

Among the well-illustrated chapters we find "Lingering Perennials," such as *Coreopsis verticillata* 'Golden Shower' and

'Moonbeam', shade-enhancing ferns—*Adiantum pedatum* and *Athyrium filix-femina*—and favorite hardy varieties, such as the hardy fuchsia, *Fuchsia magellanica*.

"Perennials Specific Unto the Season" features Japanese anemones, asters—including Lacy's own discovery, 'Hella Lacy'—and energetic boltonias like 'Pink Lacy', whose flower and foliage colors Lacy traces through the changing light of day and season. Of course, samples of the queen of autumn, the chrysanthemum, also highlight these pages, together with native surprises: pokeweed and eupatoriums like Joe-Pye weed (whose name, Lacy speculates, has kept it out of many well-intentioned American gardens) and feathery dog fennel.

In fact, Lacy's use of natives in the autumn garden seems to lie at the heart of his gardening instinct. He bids us all to bring color from the woodlands, to which, perhaps, so many of us always thought it was confined during these fiery-colored months.

Native and ornamental grasses, covered in another chapter, help to continue this bridging of the natural and the "designed." In "Some Woody Plants of Autumn," we find the brilliant foliage of native sourwood (*Oxydendron arboreum*), with seedheads lasting well into winter, and flaming Japanese maples, still treasured when their leaves have dropped to form a showy carpet.

Other sections address roses, golden ginkgoes, flashy annuals, alliums, dahlias, and many surprises. But such lists are only the elements of the garden, not its essence.

Above all, Lacy embraces a new way of seeing: a deep awareness of this season's harmonies—between the wild and the contained, between the blazing incandescence of forest leaves and the subtler hues of cool, misty mornings and ripening fruits and seeds. The goal is to see all of autumn as a complete tapestry, with new threads to be woven here and there into our experience of gardening.

—Joseph M. Keyser

Joseph M. Keyser is director of programs for the American Horticultural Society.



**AMERICAN
HORTICULTURAL
SOCIETY
46TH ANNUAL
MEETING
APRIL 17-20, 1991**

Don't miss some of the nation's best-kept horticultural secrets! Our 1991 Annual Meeting in Birmingham, Alabama, will be centered at the Birmingham Botanical Garden, with lectures and classes taking place in the gardens themselves, led by the many talented gardeners, designers, and horticulturists from Birmingham and across the state.

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This Annual Meeting will have a "hands-on" focus—an opportunity for you to work directly, in small groups, with fellow members of AHS and some of the great gardeners in the United States, with many options to allow you to pursue your own unique interests in gardening.

**PRIVATE AND PUBLIC GARDEN TOURS
WILL BE INCLUDED**

And as always, a highlight will be honoring our annual award winners—another opportunity for you to meet and share your experiences with the horticultural leaders in America.

Our Birmingham meeting is a rare opportunity that will challenge and stimulate you—whether you are a fledgling amateur or a professional horticulturist. We look forward to your joining us and sharing a wonderful few days in Birmingham. See you there!

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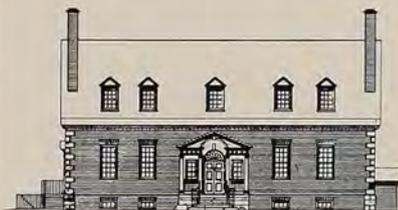
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Shattering: Food, Politics, and the Loss of Genetic Diversity.

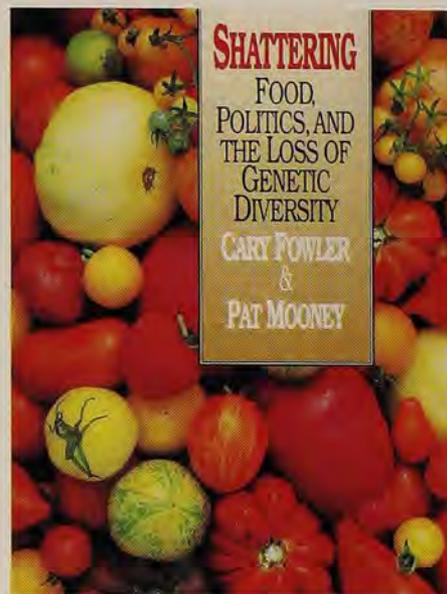
Cary Fowler and Pat Mooney. University of Arizona Press, Tucson, Arizona, 1990. Publisher's price, hardcover: \$24.94; softcover: \$12.95. AHS member price, hardcover: \$21.20; softcover: \$11.00.

Shattering is an important book, not only to those who grow food crops, but also to everyone who eats; it is also profoundly disturbing. Many readers will be alarmed by its accounts of our recent tremendous loss of plant genetic diversity and the prospect of a future without the genes necessary for breeding stress-resistant crops to feed earth's millions; others will be concerned because the authors blame much of this loss on high-yield varieties that have replaced genetically diverse traditional varieties and on the multinational companies that promote these uniform varieties and the fertilizers, herbicides, and pesticides they require.

Why the title, *Shattering*? The authors explain that the loss of earth's plant resources began when farmers first selected for domestication the plants that held their seeds instead of dispersing them by shattering. Loss of plant genetic diversity has accelerated so rapidly in recent decades that our thirty basic crops are vulnerable because of their uniformity.

Fowler and Mooney tread on a minefield of controversy when they discuss the entry of petrochemical companies into the seed trade and plant breeding; plant and gene patenting that offer opportunities for monopolization and protect uniformity; and the politics of conservation and control of plant genetic resources. They clearly feel more empathy for the peasant farmer of the gene-rich Third World than for those in the board rooms of gene-poor industrialized countries.

The authors' research in the literature and in the field has been thorough, and the text is well-organized and effectively presented. Fowler and Mooney work for the Rural Advancement Fund International, a nonprofit organization that supports family farm agriculture and the conservation of plant genetic diversity. Their dedication to these causes is well known, and on emotionally charged topics, they sometimes shift from academic to informal style: "As the pests chalk up victories on the battlefield, chemical company bravado rises in pitch"; "Bennett and FAO were the victims of an interagency mugging"; and "IBPGR suddenly changed horse in mid-gene pool," claiming that "almost the whole kit and caboodle were safely tucked



away in gene banks."

Thirty-two pages of detailed notes meticulously document sources for each chapter, but where is the bibliography? To find the complete reference for an article such as "Myers, *The Sinking Ark*, note 125, chapter 5," one must search all the preceding notes for the initial citation.

The authors warn that "the biggest environmental catastrophe in human history is unfolding in the garden." Whether future generations will face hunger, they assert, depends on how much plant genetic diversity can be saved and who controls the global food economy. This book will shatter complacency.

—Isabel Shipley Cunningham

Isabel Shipley Cunningham is the author of Frank N. Meyer: Plant Hunter in Asia, and contributing editor of Diversity, a news journal for the international plant genetic resources community.

Gardening from the Heart

Carol Olwell. Antelope Island Press, Berkeley, California, 1990. 238 pages. Color photographs. Publisher's price, hardcover: \$24.95; softcover: \$18.95. AHS member price, hardcover: \$21.20; softcover: \$16.10.

Gardeners are passionate about the art and science of gardening. But why do they choose to take a spade to a dusty, weed-filled patch of earth and battle bugs, fungi, and other pests? Carol Olwell set out to explore this question in *Gardening from the Heart* by talking to a variety of gardeners with different personalities and different methods. Olwell focused her quest on the West "because it offered the greatest

diversity of soils and climates—from deserts to alpine meadows.”

Olwell taped interviews with twenty-one



GARDENING FROM THE HEART
Why Gardeners Garden
by Carol Olwell

gardeners, then transcribed the tapes into a written statement. “It has been very difficult to find words for what happens between people and their gardens,” Olwell writes in her introduction. “I had hoped others would find it easier, but it was as hard for them as it was for me. It’s like trying to tell someone you love why you love them.” Despite the difficulties gardeners may have had in communicating their feelings for the earth, the book is a joyful expression of their experiences.

The gardeners range in age from young adults to 90. Some came to gardening late in life; some were practically born with a spade in hand.

But perhaps it’s best to let the gardeners speak for themselves.

Marcia Donahue, a former fiber artist, gardens in Berkeley, California. “I’m trying, as a transient form of life myself, to come to terms with living and dying and constant change. There is no security, or the only security is that things keep changing. In the garden, change seems so un-creepy, so wonderful at every stage. There is nothing more fluid than a garden. Nothing holds still out here!”

Debbie Carlson, a part-time dental hygienist in Anchorage, Alaska, lives and gardens two hours away in Coopers Landing, where moose nibble on the cabbages and eat the raspberry shoots. “Here we let the gardening cycle happen more naturally than if we were in Anchorage. We mainly garden for the health of it, not to save money or because we need the food. If we add our labor to our gardening costs, it would be cheaper to buy our food at the market.”

Art Combe lives in tiny Littlefield, Arizona. Now in his late 80s, he continues to develop desert wildflowers and new fruit and nut trees. “A lot of people like murder mysteries. I have the same feeling, only I like to unravel the mysteries of plants. I just love matching wits with them.”

Olwell has included organic growers, those who use chemicals, and those who use a combination of both methods. She says she was amazed at how many gardeners are unaware of the international pesticide problem. For that reason she included an appendix with reprinted articles on the safety and use of pesticides. The section seems out of place with the rest of the book, but nevertheless provides some basic information on the hazards of using chemicals.

Gardening from the Heart is a wonderful book for gardeners of all ages and experiences.

—Mary Beth Wiesner

Mary Beth Wiesner is assistant editor of American Horticulturist.

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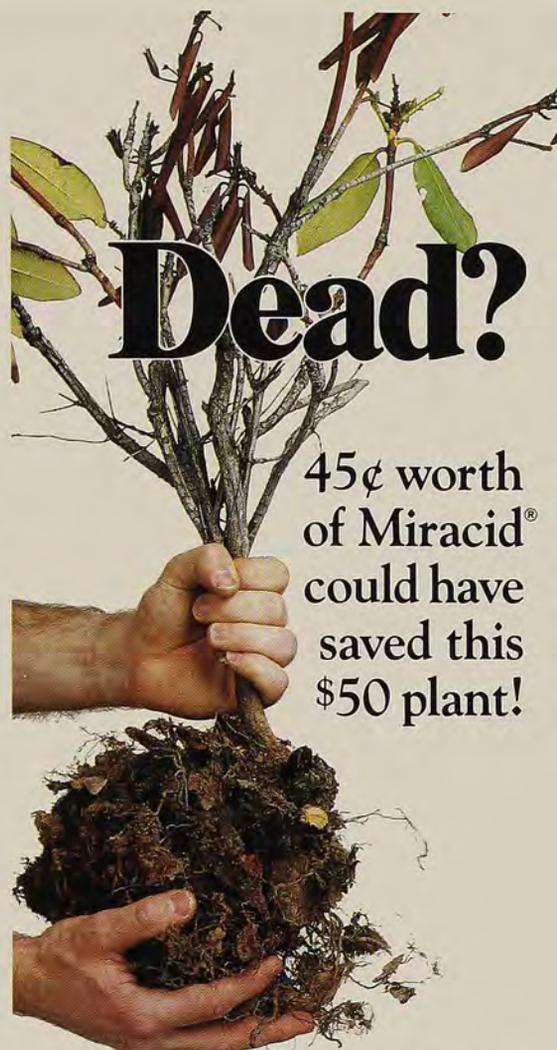
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Aquilegia canadensis is one of the "friendly natives" replacing modern hybrids impossible for Alaskan gardeners.

KEEPING YOUR COOL IN ALASKA

*Gardening in the
“high north” isn’t easy,
but row covers and
the right plants
can make it rewarding.*

B **Y** **L** **E** **N** **O** **R** **E** **H** **E** **D** **L** **A**
Alaskans like to brag: “Plant it, then—stand back!” There is some justification for this conceit. At 61 degrees, 10 minutes north latitude in Anchorage, where half of Alaska’s people live, the long summer daylight is a powerful inducement to plant growth, a case in point being the ninety-eight-pound cabbage that took the blue ribbon at the state fair last year. That is our advantage. Our challenges are the cool, cool summer soil and air temperature, the brevity of the growing season, and in some areas, the extremely frigid winters.

A quick perusal of books about gardening in this country’s “far north” disabuses Alaskans of any notion that the authors are talking about us residents of what I call the high north. Minus 70-degree winter temperatures and 100-degree summer days are common in the vast



interior, where the growing season may be as short as sixty to seventy days in some places. But there is that continuous summer daylight, in which the majority of plants revel, and the high daytime temperatures; town officials of Eagle on the Yukon River canceled their Fourth of July parade last year when the temperature reached 109 degrees.

One-fifth the size of the contiguous United States, Alaska's mainland lies in USDA Zones 1 through 7. Zone 7 is represented by a few scraps of land along the southeastern panhandle, where the climate resembles that of the rain forests of the Pacific Northwest Coast more than that of the rest of Alaska; the far south central, including Kenai Fjords National Park and Montague Island; southern Kodiak Island; and a sliver of the Alaska Peninsula. But Zones 5 through 7 encompass only a tiny portion of the land and even less of the population.

Since the cold air drainage of every mountain range creates a zone change for every fifty-foot drop in elevation, predicting what will grow in Alaska is best left to "cheechakos"—the newcomers; the sourdoughs are more wary of generalization.

In the "big part" of Alaska, there is no real darkness by the end of April, but safe planting-out time may be six weeks away. Choosing adapted varieties is critical. The always cool soil and air rule out most warm-season and even many short-season vegetables and ornamentals. Some years it is a race with time to get a "mess" of beans or enough rudbeckias to arrange in a bean pot to celebrate the coming of fall. And the prolonged winter cold limits the choice of perennial and woody plants. It is an austere gardening climate.

Gardeners feel keenly the lack of such mainstays of the flower border as bearded iris, summer phlox, tender roses, chrysanthemums, and hybrid daylilies. But south central Alaska gardeners will find no place else where delphiniums and tuberous begonias grow to such magnificence. This is peony country, and columbine, bleeding-heart, campanula, and dahlia country. Such neglected perennials as Maltese-cross (*Lychnis chalconica*) and *Trollius* species make a bold statement. By June, gardens are awash in arabis and forget-me-nots. A great explosion of bloom is set off by doricum, tulips, *Veronica grandiflora*—the little speedwell that comes from the outer reaches of the Aleutian Chain—and *Anemone richardsonii*, which skipped over the Bering Strait without benefit of a

visa and now carpets our tundra with gold.

Are the natives friendly? You bet. Many wildlings have settled down in town gardens to replace the modern hybrids that are denied us and they do so with great grace. The native iris, *I. setosa*, goatsbeard (*Arun-cus dioicus*), cranesbill (*Geranium erian-thum*), the wild columbine (*Aquilegia canadensis*), dwarf dogwood (*Cornus can-adensis*), the diminutive *Papaver alba-roseum*, a rare poppy found only in the moraine left behind by Portage glacier, and the spring crocus, *Anemone patens*, are only a few of the jewels in a national treasure in wildflowers.

Tough species from other high-latitude countries are welcome immigrants: *Tulipa tarda* and *T. kaufmanniana* and other botanical tulips from central Asia, and *Viola altaica* get an early wake-up call from late April into May in my Anchorage garden. *Rosa spinosissima*, *R. spinosissima* var. *altaica*, and the rugosas and their hybrids are no substitutes for the hybrid teas, grandifloras, and floribundas, but they are warmly welcomed on their own merits, as are several old shrub roses of northern origin. Mongolia gave us our only flowering perennial vine, *Clematis tangutica*.

The rock garden seed lists are rich sources for species that may make themselves at home in the high north. I scan their lists for seed collected in northern Scandinavia, Iceland and Greenland, the northern republics of the Soviet Union, and northern Canada—all the high-latitude countries whose plants have acquired a tolerance for prolonged cold and summers that have no darkness. Such plants just may settle down happily in my garden on a high bluff above Cook Inlet on the border between Zones 3 and 4. A German professor spotted my name on a rock garden society membership list and asked if I would like to trade seeds from northeast Asia, to which he had access but I did not. He sent me a king's ransom in seeds from Mongolia and Siberia in exchange for common Alaska wildlings.

Several seed companies cater to northern needs for vegetable seeds. Most root crops flourish as do peas, the cole crops, lettuce, broad and runner beans, celery, and the culinary herbs. Seed saver exchanges offer northern heirloom varieties no longer in commerce. Vegetables that have won the All-America Selections award because they shave a few days off the maturing time of marginal plants are good bets for discerning gardeners.

Not all gardeners are content to accept

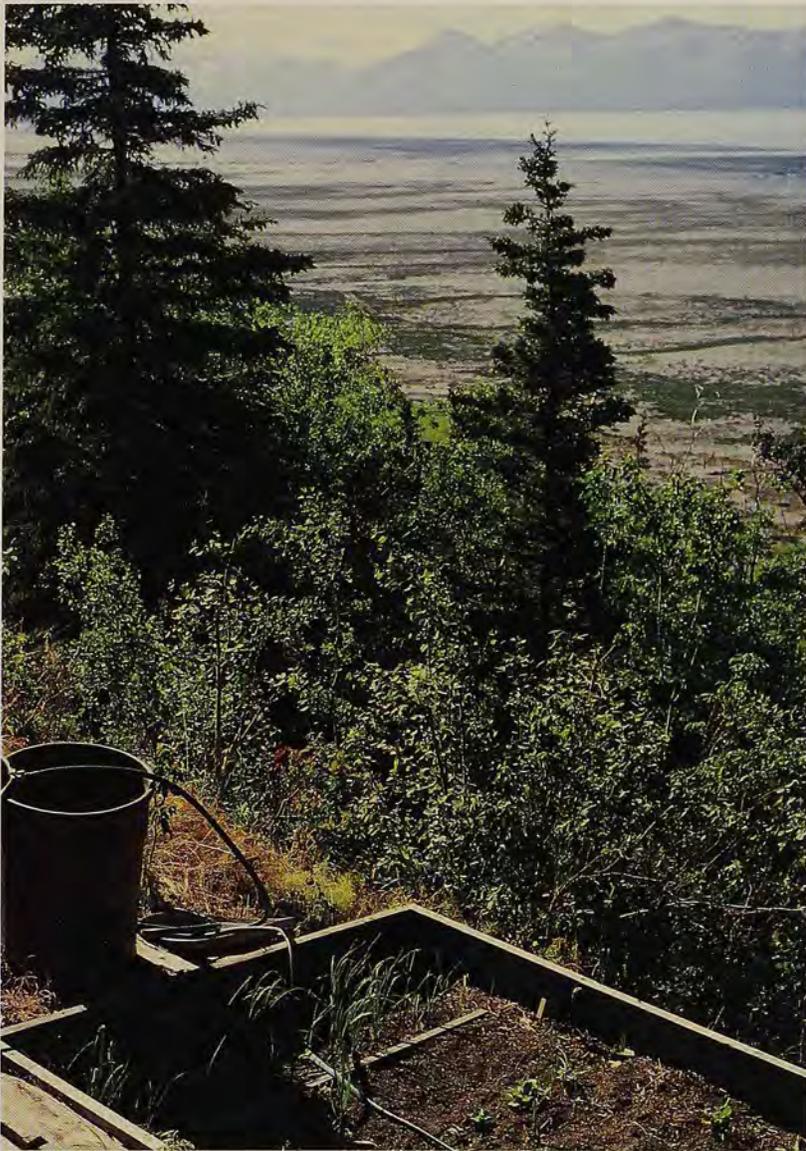


PHOTOS BY LENORE HEDLA

these limitations and they keep seeking ways to warm things up. These zealots have taught us all that cunning can often overcome climate. They take pleasure in putting another notch in their hoe handles when they find a way to grow some plant that "won't grow in Alaska." I am not one of these, although I am married to one; theirs is an aberration with a low cure rate.

It is well known that seedlings will grow at a temperature too low for seeds of the same plant to germinate; presprouting seeds saves a few days and can make the difference between a bean year and a lean year. The homesteaders rolled their seeds in a damp towel and stored them in the warming oven of their wood ranges. However, there are few warming ovens around today and the fluid-gel techniques developed at Cornell and Michigan State universities are being adopted here.

In this method, seeds are presprouted on a paper plate under a wet paper towel. A solution of three tablespoons of cornstarch



PHOTOS BY LENORE HEDLA



Opposite, top: A “bottle garden” of water-filled wine jugs collects solar heat in the long days of late April. Bottom: Onion bags help protect apple tree branches from browsing moose.

Left: A raised bed produces early lettuce and late-season garlic; sun-warmed water in a plastic trash can irrigates sandy soil blown up from the shore of Turnagain Arm.

Above: Dr. Curtis Dearborn grafted ‘Summerred’ apple scionwood onto the rugged Siberian crab to produce south central Alasaka’s first apple of eating quality.

to one cup of water is heated until it thickens. When cool, the gel is poured into a small plastic bag and the sprouted seeds are scraped gently into it. The bag is secured with a twist tie and one lower corner of the bag is snipped open. Then the sprouts are squeezed out, as you would toothpaste. Not only do seeds get off to a faster start, but the method virtually eliminates thinning and is convenient for fine seeds.

Raised beds and mounded rows warm up faster than level ground. Prewarming these beds with clear plastic tarps is worth the trouble. The black plastic mulch used in the rest of the country—the land Alaskans call “Outside”—does not work well here. Black plastic feels warmer to the touch than does the bare ground, but Donald Dinkel, a University of Alaska-Fairbanks horticulturist, discovered that clear plastic admits more of the sun’s heat and warms the top four inches of soil, where seedling roots are. True, weeds grow like mad under the clear plastic, but they do not set much seed be-

cause few bees and flies can get through to pollinate them. And the vigorous weeds even help their cultivated bedmates by pushing the plastic up and creating warm, moist air spaces for them.

Any mulch that keeps the sun’s rays from the cool soil is a growth retardant during the gardening season. Winter mulches are a different story. By holding in what remains of summer’s warmth and protecting plants from rapid changes in soil temperature, such as our infamous January thaw, it gives many marginally hardy plants the needed edge for survival.

A house never has enough south sides for bulbs and perennials, and a yard never has enough gentle south-facing slopes for the vegetable garden. Alaska gardeners are always looking for another Mr. Goodspot, sometimes building a solid wood fence that doesn’t go anywhere but makes a south wall out of a northern exposure.

They try to raise the air temperature around young plants to increase their

growth rate. Early on, they learned to cut the bottoms out of clear glass jugs, using the removable caps as ventilators on sunny days. The introduction of plastic milk jugs reduced the seasonal bloodletting. From these homemade cloches, it was a short step to rowcaps, or tunnels, that would cover a whole row, maintaining warm air temperatures into the chill evening hours, and as a bonus, protecting plants from many insects’ egg-laying propensities.

Gardeners in the high north took off on a round of inventions, some of them—like cold frames tall enough to house a squash vine—pretty funny. But their inventors had the last laugh. The list of crops that wouldn’t grow in Alaska got shorter each year as they experimented with sweet corn, tomatoes, cucumbers, squashes, pumpkins, onions, leeks, garlic, radicchio, asparagus, and bush beans—pole beans are still a greenhouse crop.

Greenhouse-grown peppers attracted aphids; grown outdoors under row covers

they did not and furthermore, they ripened. Some of these iffy crops made it in some places but not in others. Not far from Anchorage, a Matanuska Valley gardener was able to entertain her twenty-three coworkers with a corn feed; a Kenai Peninsula gardener grew 100 tennis ball-size muskmelons under double plastic row covers; when a neighbor installed a hive of bees, he got 200 muskmelons.

Onions are a cool season crop, but a long season one, and garlic and storage onions are fussy about bulbing until the days grow short enough; by then, frost is digging in for the winter. But under row covers, marginal biennials and perennials make it through the critical freeze-and-thaw days of spring. The gardeners who tried clear plastic mulches and row covers were onto something.

The introduction of spunbonded polypropylene and polyester “floating” row covers permitted earlier hardening off, kept egg-laying insects at bay, and produced earlier crops of vegetables that had been only marginally successful.

We knew that plain water collects more solar heat than a fifty/fifty mix of antifreeze, or steel, concrete, stone, brick, earth, sand, or wood. But what would be the best container for the water? My husband filled a tipsy collection of club soda bottles, wine jugs, and opaque plastic milk jugs with water and took their temperatures morning and night to see which was the best solar collector. The one-and-half

liter wine jugs won, and were tucked under row covers next to tender plants to release their warmth during the chill evening hours.

Watering practices were due for reform. Watering late in the day sent plants into the night wet and chilled; watering in the morning, when the plants were cold, did not shock them into insensibility. Soaker hoses that dripped cold water from the earth’s icy depths kept plants cold for hours; when water pressure was turned up high, the droplets that soared into the air picked up a bit of the sun’s warmth. Sun-warmed water in fifty-five-gallon oil drums with bungs for connecting a hose was even better, although the barrels were no great asset to the landscape.

The long daylight of the subarctic that can be harnessed to hasten the growing season is the downfall of many woody plants, because the long days do not allow them to get ready for winter in a timely manner. Trees and shrubs that are hardy in the northern tier of the contiguous states succumb to milder temperatures in south central Alaska, and the minus 50- to 60-degree temperatures of Fairbanks are far too severe for them.

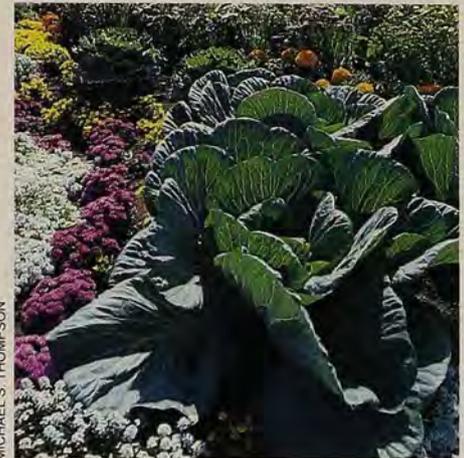
Trees that do survive the cold may fall victim to the high sun of the spring equinox—29 degrees above the horizon at Anchorage. Sap thaws on warm days, freezes at night, and ruptures the capillaries. Young, thin-barked, deciduous trees, with no leaves to shade their trunks, are the most vulnerable, so the apples that survive comparable temperatures in other Northern states are a frustration to Alaska growers. There are numerous hardy crabapples, but Alaskans asked plaintively: “Why not *apple* apples?” A breakthrough came when Dr. Curtis H. Dearborn of the agricultural experiment station at Palmer successfully grafted ‘Summerred’ scionwood onto *Malus baccata*, the tough Siberian crab, to produce the first high-quality eating apple to ripen on the trees of south central Alaska.

Even the doughty European mountain ash, *Sorbus aucuparia*, and the rugged native white paper birch, *Betula papyrifera*, are not always immune to the high sun of spring. Besides, their bark and lower branches are irresistible to the moose that roam urban gardens when the snow in the mountain valleys is too deep for them to find browse.

Commercial tree wraps help, as do homemade versions of coiled rope or cylinders of roofing material. The addition of hardware cloth prevents the bark from being stripped,



DICK KEEN



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Sources of Cold-Hardy Plants

Alpine Garden Society, Lye End Link, Saint John’s, Woking, Surrey, England GU21 1SW.

American Rock Garden Society, Buffy Parker, Secretary, 15 Fairmead Road, Darien, CT 06820.

Farmer Seed and Nursery, Faribault, MI 55021.

Johnny’s Selected Seeds, Foss Hill Road, Albion, ME 04910.

Nichols Garden Nursery, 1190 North Pacific Highway, Albany, OR 97321 (for herbs).

Park Seed Co., Cokesbury Road, Greenwood, SC 29647-0001.

Territorial Seed Co., Box 27, Morane, OR 97451.

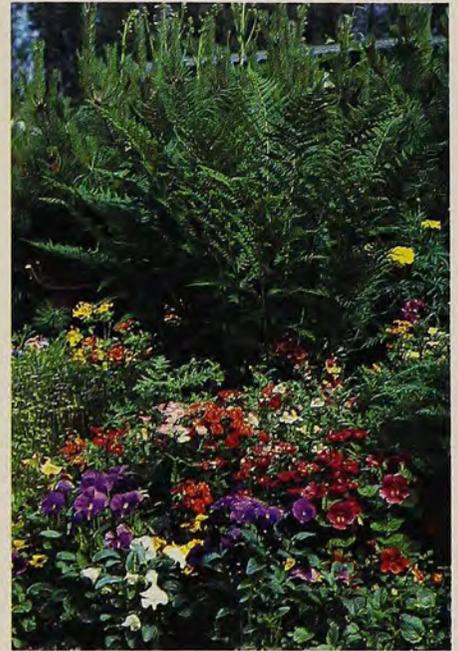
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but not the loss of young tree limbs much relished by the moose. Commercial tree guards show promise: a thirty-two-inch-high white plastic exterior keeps the trunks cool in the spring, and fends off rodent and moose damage in winter.

The flip side of long summer daylight is, of course, long winter darkness. Eight months’ indoor dormant storage is too long for some plants. Geraniums hung on basement clotheslines in the time-honored way don’t make it. In the old days, many a geranium bloomed cheerily in wintry log cabin windows where the chinks between logs leaked cool, moist air. Today’s double- and often triple-glazed windows and central heating are not on their want list. It is a lost cause to store “mother plants” of fuchsias and potted tender roses in crawl spaces that are usually too warm to induce dormancy, or garages that may reach freezing temperatures.

Container-grown plants get warmer root zones than the ground offers and they



Opposite, top: Cornus canadensis. Middle: Giant 'O. C. Cross' cabbage and annuals in an Anchorage park bed. Bottom: Seedheads of Clematis tangutica, Alaska's only perennial flowering vine.

Left: Iris setosa. Above: An Anchorage home garden explodes with violets, pansies, and monkey flowers.

can be scooted indoors when frost is forecast, which may occur in early June and late August. Much of Alaska has the cool, misty summer climate of the California coast where fuchsias reign over the scene, and geraniums and tuberous begonias can also be showoffs, but none are winter hardy. Some urban garden centers store baskets of fuchsias and geraniums, and tubs of tender hybrid roses and rhododendrons for less than \$25 each for eight months.

On December 21, Anchorage has five hours and twenty-two minutes of daylight, and at noon, the weak sun is only 6 degrees above the horizon. This provides a strong incentive for plants to lapse into dormancy unless supplemental light is provided. With the discovery of copious quantities of natural gas, sunrooms proliferated, providing a great boon to winter living in the North. Some flowers bloom all winter in these cozy sitting rooms under table and floor lamps with circular fluorescent tubes, and full-spectrum,

high-intensity daylight lamps.

Outdoor lighting, an amenity once considered hilarious in a country where it doesn't get dark all summer, has made the winter less formidable. Black glass reflections are exchanged for vistas of frosty trees, falling snow, outdoor sculpture, children skating on back yard rinks, and diamonds on the snow.

Visiting reporters sometimes write eloquently of Alaska's "fertile, virgin soils that have never known a plow." Alaska's soils are young, recently born of the Ice Age. They are infertile, but tremendously responsive to the addition of nutrients and organic matter. Animal manures are scarce; large quantities of steer manure or peat moss are expensive. Coastal gardeners compost kelp and gurry, or fish wastes. Everywhere birch and poplar leaves are bagged and held over winter to be alternated with layers of grass clippings when spring arrives.

Compost decomposes with all the

alacrity of a retreating glacier. Most gardeners count on two years for finished compost. Those with mechanical chipper-shredders may spread chopped kitchen waste and heavier garden waste on fall-tilled gardens and get partly decomposed matter the following summer.

But recently, Alaska appears to be on a roll with a prolonged warming trend. Whether it's simply a cyclical warm period like others I've seen in my thirty-seven years of gardening in Alaska, or a portent of the much discussed greenhouse effect, it has brought some welcome relief from deep winter cold and summer chill.

It's a great land, Alyeska—as the Bering Strait migrants named it centuries ago. You should come and see the state we're in!

Lenore Hedla is a free-lance garden writer who lives in Anchorage, Alaska. She has gardened in south central Alaska for thirty-seven years and is the author of The Alaskan Gardener's Handbook.

Galax urceolata is one of the slow-to-propagate native species for which Bill Brumback is seeking the best tissue culture formula. Right: Brumback transfers a micropropagated turkeybeard to soil.



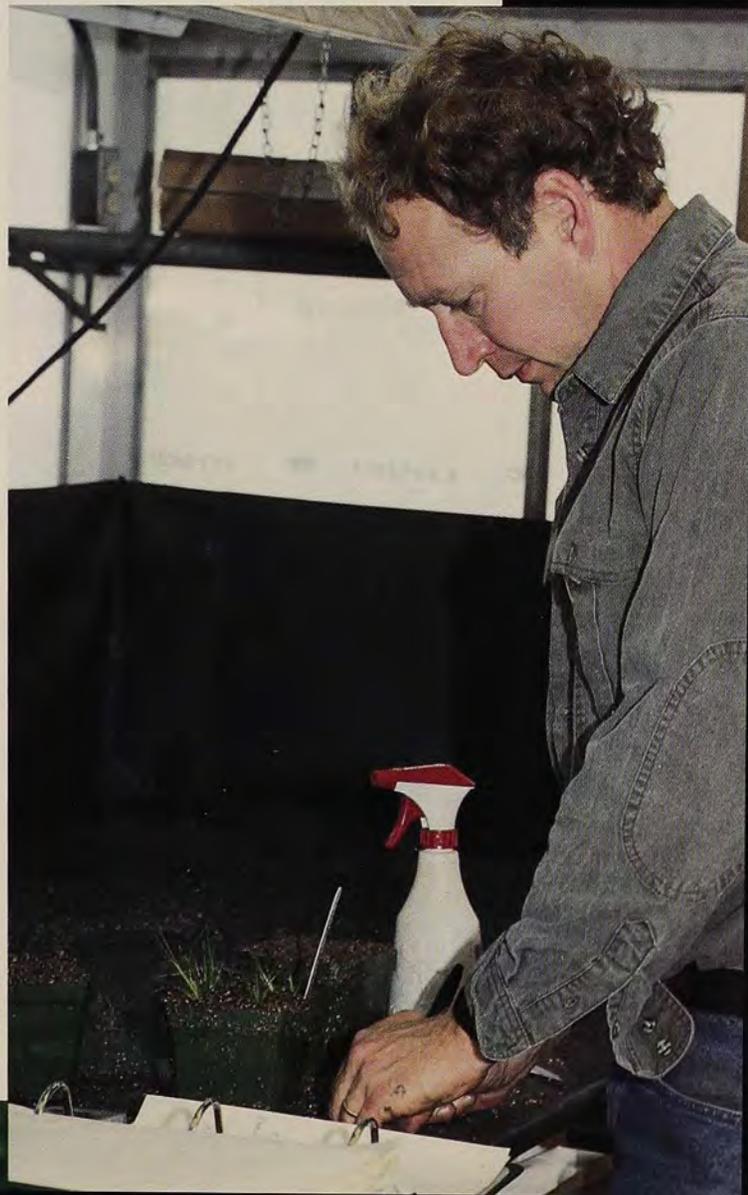
Recipes for NATIVES

The New England Wild Flower Society's Bill Brumback hopes tissue culture will reduce wild collection of regional species.

BY MARTY CARLOCK

WE HAVE TO TAKE OFF OUR SHOES TO GO IN THE LAB," Bill Brumback tells me. While I fumble with sneaker laces, he pries off his moccasins with his toes. His colleague, Terri Cogliano, sheds tan work boots that she seldom ever ties. Clearly, moccasins are the footgear of choice for researchers who spend time in tissue culture laboratories.

Brumback and Cogliano experiment in micropropagation, the business of growing snippets of plants in test tubes. Shoes are left outside because contamination is the chief enemy of their work. Reluctance on the part of the plant is another difficulty, and at present their experiments center on finding



MOLLY LYNCH



PHOTOS BY JOHN A. LYNCH

Top: Heather McCargo, propagator at Garden in the Woods, harvests seed from the white wood aster (*Aster divaricatus*). **Above:** The red trillium, or wake-robin, takes two years to germinate. **Opposite:** A path through the Garden in the Woods, headquarters of the New England Wild Flower Society.

the growing medium in which each of certain difficult native species is happiest.

Brumback is director of conservation for the New England Wild Flower Society, a nonprofit organization in Framingham,

Massachusetts; Cogliano is lab manager at Weston Nurseries, a commercial firm in Hopkinton, Massachusetts. At the wildflower society's forty-five acre Garden in the Woods, Brumback propagates plants in more conventional ways, but there he does not have the laboratory necessary for tissue culture. Weston Nurseries donates space and some of Cogliano's time to aid Brumback in his project to learn how to produce, in quantity, hard-to-propagate native plants. Their work is part of the society's campaign to develop alternatives to the collection of wildflowers for resale by commercial dealers.

Simplistically, tissue culture may be described this way: The researcher takes a piece of a plant, cleans it, and puts it in a sterile growing medium. "And hopefully they just go *pkoof!*" Brumback makes an unspellable explosive sound and makes his touching fingertips fly apart.

That means, if the plant finds the chemicals congenial, it puts forth a number of new shoots. When it has six to ten or so, the researcher snips them off and puts each into its own growing medium. Repetition of the process results in hundreds, then thousands, of plants.

What's the advantage? Speed and genetic control. The disadvantage? Cost—as compared to the cheap route, digging wild plants.

"I could show you catalogs that offer trilliums for twenty-eight cents a piece, if you buy a thousand," Brumback says.

Botanists worry whether nature can sustain such yields, even in areas where given species are prolific. Lacking scientific before-and-after surveys, Brumback won't say categorically that wild collecting can wipe out a species. But it has hurt. "It has been established that, over time, such practices can wipe out local populations." Decimation of lady's-slippers in Michigan and Venus's-flytraps in the Carolinas has resulted in laws prohibiting their collection.

Brumback hopes his work will eventually make available enough coveted native plants that gardeners will buy lab-cloned wildflowers rather than wild-collected ones.

In the last decade tissue culture has come to be rather widely used by commercial nurserymen to grow such ornamental favorites as mountain laurels, rhododendrons, and hostas. "They can build up a large stock quickly," Brumback explains, "and they can be sure of retaining genetic characteristics, such as color." Because such seedlings are clones of the same plant, they are genetically identical.

Applying tissue culture techniques to native plants, as Brumback is doing, is relatively rare, except for some researchers attempting terrestrial orchids. "In the past

it wasn't thought of," he says. "It was thought there was no real need"—because people could just go out and dig them. He emphasizes that tissue culture is not only expensive, but it is not a foolproof method. It is best reserved for plants not easily or quickly propagated by any other means.

There's a misconception that tissue culture can rescue rare and endangered species. "I'm not working with rare and endangered species," says Brumback, "because in those cases tissue culture is not necessarily the right thing. It doesn't give you any genetic diversity." If the intent is to grow endangered plants and reintroduce them into the wild, they need to be grown from seed, however difficult that might be.

Where tissue culture can help, he continues, "is in taking the pressure off the wild plants"—producing enough plants for sale that no one will be tempted to raid the woods and meadows and create more endangered species.

For instance, *Epigaea repens* (trailing arbutus)—the Massachusetts state flower—was picked nearly to extinction before it became protected. Cogliano and other researchers at Weston Nurseries began to clone a pink form; it has become a success story. The micropropagated arbutus has now reached "production" status; there are enough plants that it's for sale at the nursery.

Brumback and Cogliano hope to develop formulas for growing media that will best propagate some slow natives, such as *Trillium*, *Galax*, and *Shortia*. Brumback is writing a professional paper on this effort and plans to publish when his data are firmed up.

Two species of *Trillium*, the dark red wake-robin (*T. erectum*) and the white *T. grandiflorum*, are a focus of Brumback's current work. "*Trillium* takes two years to germinate and another three to five years to get to blooming size, so you're talking five years. At least." It's his hope that tissue culture methods can shorten that span. The process can also produce many more plants in a given span of time.

Why is *Trillium* so slow? Brumback's laugh is explosive. "I wish I knew!"

Like many of the reluctant reproducers Brumback works with, *Trillium* normally grows in the shade of the forest, and such plants apparently don't need to propagate as quickly as meadow natives. "You can see how, in the sun, there's a race among plants to see who gets a fresh spot. Those plants benefit from being able to germinate quickly," observes Brumback. "But in the



JOHN A. LYNCH

NINETY YEARS OF CHAMPIONING NATIVES

Twice a week or more last summer, Heather McCargo and Patricia Diggins went on a quest through the shady Garden in the Woods. Carrying pencils and a stack of brown envelopes, they stooped and lifted aside leaves, developing a good instinct for where to look for their quarry, and when.

McCargo, the garden's propagator, and Diggins, a seasonal intern, were harvesting seed from some of the 1,500 or so species of native plants cultivated and displayed by the New England Wild Flower Society on its forty-five acres in Framingham, Massachusetts. In late winter, 200 varieties of wildflower and fern seeds will be offered to society members and other interested wildflower growers.

Seed sales are only one of the society's methods for encouraging the propagation—rather than collection from the wild—of desirable native plants. During the growing season the society continuously propagates and offers for sale some 150 varieties of perennials, mostly indigenous, plus a few cultivars of native species and special exotics. It hosts a one-day plant sale in early June that vends more than \$20,000 worth of plants.

The New England Wild Flower Society traces its roots to the Native Plant Society founded in Boston in 1900 by Amy Folsom. Enthusiastically amateur, with no offices and no dues of its own, the society received mail at the offices of the Audubon Society. In 1922 the Garden Club of America, seeking to extend its conservation work into New England, contacted the Native Plant Society. Then in ill health, Folsom was happy to allow her society to be absorbed into the new Society for the Preservation of Native New England Plants, chaired by Mrs. S. V. R. Crosby. From the first, the society considered its mission educational.

Meanwhile, a crusty and eccentric landscape architect, Will C. Curtis, had bought thirty acres of glacial ridge, ravine, bog, and pond in rural Framingham. A plant collector since childhood, he had begun a native plant garden in uninteresting terrain in West Boylston. His accidental discovery of the Framingham site fired his imagination. He was in luck; the Old Colony Railroad was happy to sell it to him for \$1,000.

Creating the garden became Curtis's life, but his abrasive personality alienated a series of volunteer helpers until he hired Howard O. "Dick" Stiles. Out of work as a result of the Great Depression, Stiles worked for little more than room and board. He too almost left, but Curtis—soft-hearted under the gruff exterior—persuaded him to stay, and the two became partners.

Their goal was to grow and propagate as many American plants as would survive at 42 degrees north latitude. They created a pond environment, a bog, a meadow, a desert area, a rock garden, and of course a woodland. The garden became a showplace and, simultaneously, a display room for Curtis's landscape design practice.

In the early 1940s, Garden in the Woods was designated a botanical garden. Curtis found himself obliged to tend to seed exchanges and plant sales as well as his business and the tours and lectures he gave in the garden. As he approached 80, he realized the garden could not be maintained without his professional earnings. Suburban developers licked their chops over

the beautiful acreage; a sand and gravel company offered a quarter-million dollars for the gravel rights.

Horrified, friends cast about for a solution and located the obvious one, the Boston-based New England Wild Flower Society. Curtis gave the garden to the society; a nationwide campaign raised a maintenance endowment, and, prudently purchasing fifteen more acres, the society moved its headquarters from the city to the Curtis property.

Retained as director, Curtis lived at the garden until his death in 1969 at the age of 86; his ashes were scattered among his beloved plants.

Among the society's activities today are more than 100 courses annually, from one-shot lectures to extended field trips. Newly in place is a three-year course of study leading to a Certificate in Native Plant Studies. "Interest in native plants is so enormous," says society spokesperson Barbara Pryor, "that without exception our courses are always filled. We sometimes have to add a second section."

The society's director of conservation, William E. Brumback, oversees a greenhouse and nursery beds at the gardens in addition to his research on tissue culture propagation of dif-



JOHN A. LYNCH

Plants for sale at Garden in the Woods.

ficult native plants (see accompanying article).

The garden is now a designated Center for Plant Conservation, one of twenty throughout the country. The society has established a conservation department headed by Brumback to encourage propagation of endangered species. One of its goals is to set up a garden akin to Garden in the Woods in each of the six New England states.

To encourage purchases from nurseries that propagate the native plants they sell, rather than buying them from collectors, the society produces and sells a list of such grower-propagators throughout the United States, as well as booklets on cultivating and propagating wildflowers.

Getting garden-grown "wild" plants is advantageous in several ways, Brumback says. "You're assured no wild populations are destroyed. Propagation is the only way to get some of the interesting forms and colors. And chances are better it will grow in your garden. It's pre-adapted."

shady forest, the habitat is less disturbed.

“And you can understand why a plant might require a cold period before it will germinate. Because if it drops seed in the fall and that germinates right away, it would begin the winter as a small seedling. This adaptation makes it hold up germination until spring. But why *Trillium* requires *two* cold periods with a warm period in between...I have no idea!”

For four or five years Brumback has spent Friday mornings in the lab in Hopkinton. “It’s not very long, really,” he says. He downplays his accomplishments so far. “I don’t think we’ve had any terrific successes. There’s a lot of plodding.”

The lab work is exacting. The room we enter after leaving our shoes is the transfer room. Its centerpiece is a laminar flow hood, a lighted space where air is superfiltered to provide a sterile environment. Here Brumback sits to insert his tiny cuttings into their capsules.

Cogliano has sterilized his tools and plant containers in an autoclave elsewhere in the propagation shed. “Basically an autoclave is just a big pressure cooker,” she says. “It heats to 250 degrees under fifteen pounds of pressure for fifteen minutes.”

The two researchers discuss recipes for growing media; she concocts what he terms “the nutrient soup” they’ve agreed on for a particular species. They have a lot of choices. The medium contains vitamins, hormones, nutrients and micronutrients, a carbon source (usually table sugar), and agar as a jelling agent. The medium sets up as a milky jelly.

Cogliano and Brumback work in an easy, collegial harmony. Jointly they decide when each of Brumback’s plants is ready for the next step. Cogliano’s work otherwise comprises the commercial production, by tissue culture, of some plants that the nursery sells.

Cogliano came to Weston Nurseries six years ago, after an internship at Garden in the Woods while she was working on a biology major at Framingham State College. Brumback has been propagator at Garden in the Woods for a decade. His career choice was something of a surprise to him. In 1971, fresh out of Washington and Lee University with a degree in psychology, he was unsure what he wanted to do next, so he and a buddy arranged jobs in Holland working with bulbs and herbaceous perennials. He had no real interest in plants at that point; except that he liked sports, he wasn’t even an outdoorsman.

Because they arrived in winter, the two

Americans began by sorting bulbs in the Dutch bulb factories. “Then when spring came I got a job outdoors with a perennial grower, and we both got hooked. We liked the physical aspect of it—and the mental aspect.” Back in the United States, Brumback then spent four years as head propagator for a wholesale nursery in Maryland dealing in perennials, ornamental grasses, wildflowers, and herbs. Awarded a fellowship, he earned a master’s degree in horticulture from the Longwood Program of Ornamental Horticulture at the University of Delaware. His thesis dealt with endangered plant programs for North American botanical gardens.

The job opening at Garden in the Woods seemed made to order for him, combining his interests in propagation, native plants, and endangered species. Although he had worked in the commercial field before entering graduate school, he was more interested in botanical gardens.

Through professional contacts, Brumback met Ed Mezzitt, then owner of Weston Nurseries. “He was interested in tissue culture, and he wanted to try native plants,” Brumback recounts. Mezzitt offered research time in his tissue culture lab, and Brumback accepted.

Recently married to a landscape designer, Brumback confesses that he doesn’t do any flower gardening at home. “All we have at the moment is a vegetable garden.”

Brumback is diffident about his research. “There are better people out there who know more about tissue culture than I do,” he says. “It’s a long road. We have a lot more experimentation to do before we know what works best.” How long might it be? “I wouldn’t want to say.”

When he does publish his conclusions, “it’s not going to be proprietary,” he adds. “We just want to get the information out there, so everybody can use it.”

The groundwork already done by others includes the development of culturing media for various species. Many media recipes start with the MS formula, a combination of salts and iron developed by two researchers named Murashige and Skoog. Brumback and Cogliano ad-lib and vary such recipes according to the species of plants they want to grow.

The researchers clean the plants, washing them with soap and water, sometimes alcohol, sometimes with a 10 percent

Plants that grow from a low-foliage crown, as swamp pink does, are hard for micropropagators to handle.



JOHNA LYNCH



Brumback's team is making progress with the tissue culture of turkeybeard.

Clorox solution. "It sounds like a mean and nasty and ugly thing to do to a plant," he says, "but contaminants are mean and nasty and ugly, so you have to go after them." Sometimes plants don't survive this "disinfection." Bigger pieces of plant tissue are more difficult to get really clean but more likely to live through the cleansing.

The "test tubes" are little cubes or egg-shaped containers with halves that come apart. Because they and the medium are transparent, the propagators can see what's happening to them.

Brumback searches through a tray of clear eggs with tiny plants growing in them. "There's one!" He picks out the offender.

Sources and Resources

Publications/membership/seed information: New England Wild Flower Society, Hemenway Road, Framingham, MA 01701, (508) 877-7630.

To receive the 1991 seed list, send \$1 and a self-addressed business-sized envelope, 45 cents-stamped, to the above address before March 1. Seed sales close March 15.

For the enthusiast who wants to try tissue culture, Brumback recommends *Plants from Test Tubes*, by Lydiane Kyte, published by Timber Press (1983) in Portland, Oregon.

"See that white stuff growing on the side of the plastic? That's contamination." The villains can be bacteria, molds, yeasts, or mites.

"I'll autoclave that," says Cogliano. Zapping contaminated material in the "pressure cooker" kills the plant, but it's necessary so unwanted invaders don't contaminate others.

The next step is to transfer an "explant"—the piece of tissue selected for propagation—from sterile solution to sterile container. "You take an actively growing piece of tissue, such as the tip of a shoot, and snip it off," explains Brumback.

Working with forceps under the hood, Brumback places the disinfested plant tissue in the growing medium and claps the lid of the small cube back on. Later, larger plantlets will get larger plastic boxes, resembling square refrigerator containers.

The plastic eggs function as small, self-contained terrariums; the medium, though jelled, provides moisture and everything else the plant needs except light.

"Nobody understands how long the nutrient solution lasts—when or whether the nutrients are used up," Brumback relates. "They dry out some. You have to change them continually—every six weeks at least."

Cogliano says most explants get sixteen hours of daylight, which is provided by cool white fluorescent lamps, then eight hours of darkness, in temperatures of 70 to 80 degrees in summer though somewhat lower in winter.

Admiring the progress of a tray of trillium, Brumback finds contamination in the form of a dark mold. The plant has put out a good root system, though. "I may keep this and see what happens," he muses, "because it's a trillium"—and hard to get to this stage.

We're obliged to don our shoes to walk across the floor of the potting shed to the media room, where Pat Webster, Cogliano's assistant, is turning out trays full of plastic eggs with a nutrient soup of a different color—sooty black. Brumback explains: "This is rooting medium. Carbon is added to take out the cytokinins, the growth regulators, and encourage the auxins, the rooting hormones."

Now we go outside to check on plants that have graduated to potting soil and are being held in nursery frames. Brumback says this is the third major problem—finding out how best to ease the transition from the agar medium to bona fide dirt. Some plants want all the agar washed off, for instance; some don't. But the basic difficul-

ty is that the plant is going from a pampered state—100 percent humidity, all the nutrients it needs at its root tips—to the real world.

Brumback is delighted to find grasslike clumps of turkeybeard (*Xerophyllum asphodeloides*) flourishing in the frames. He points out oconee bells (*Shortia galacifolia*). "We have some success with this, some failures. If we have 50 percent rooting survival with *Shortia*, we're happy." He exults over pixie moss (*Pyxidantha barbata*) and showy lady's-slippers (*Cypripedium reginae*), one of the difficult wild orchids.

Although Brumback has nurtured some orchids from test tubes, orchid seeds are tiny and hard to handle. "Some of these you have to do from seed," he confesses. "And *Helonias* (*H. bullata*, or swamp pink) and pixie moss are so difficult: you can't get the seedlings clean" of enough potential contaminants for tissue culture. Pixie moss is also very small, and any plant like *Helonias* that grows from a low-foliage crown is hard for micropropagators to handle.

While Brumback may dismiss the actual propagation work as plodding, fellow professionals feel he has already done a lot to change attitudes. "Bill's work is bringing professional credibility—clout—to solving problems created by the marketing of wild plants," says Viki Ferrenia of Wayside Gardens in Hodges, South Carolina. As assistant horticultural director of a large mail-order retail nursery—one of an increasing number that pledges not to sell wild-collected plants—Ferrenia is in a position to see the industry's and the buyer's dilemma.

"People get very nostalgic about native plants," she says. "They can be easily seduced into going into the woods and bringing plants back for their gardens. They can contribute to the demise of these plants without even realizing what they're doing."

And in some rural areas wild-plant collection is a business. If horticultural researchers can develop other ways of providing plants that are profitable and relatively easy—and ecologically responsible—Ferrenia believes the plant-sale industry would adopt them.

"What Bill is doing is consciousness-raising," she concludes. "He is bringing a conscience to the industry."

Boston free-lancer Marty Carlock writes about nature, art, and education for the Boston Globe and other publications.

Proven Performers



T IRED OF READING ABOUT NEW INTRODUCTIONS? Each winter, *American Horticulturist* asks some of the specialty plant societies, of which there are about 200 in this country, to name not the new kids on the block, but the classics. This year, the American Orchid Society describes plants we may have first read about in an old detective novel—and assures us there is nothing mysterious about growing them. The American Bamboo Society tells us more about plants used by the ancients for food and tools, but whose vertical habit makes them perfect for modern gardens. The American Begonia Society's choices range from the “angel-wings” our grandmothers used to grow to relatively new, more heat-tolerant “tubers.” Whether you try just one of these winners or become a lifetime devotee, we hope you'll think to call on these groups when you need sources, advice, or new gardening friends.

Orchids

The lore that has surrounded orchids for three centuries—that they are exotic, majestic flowers in dense, inaccessible jungles, inspiring intrepid collectors to brave hostile natives, disease, hunger, and snakebite—has deterred many would-be orchid growers from enjoying these jewels of the plant kingdom and from discovering just how easy they are to grow. On windowsills, under fluorescent lights, or in a greenhouse, orchids offer a diversity of form, color, and size—a diversity unmatched by any other plant family. With an estimated 25,000 species around the world, the orchid family occupies almost every conceivable type of habitat.

It is difficult to list in a short space all the reasons why people from all walks of life—as many as 100,000 growers in the United States alone—have adopted orchids, even to the exclusion of other plants. Perhaps it is the diversity of the flowers, some larger than a dinner plate and others small enough to fit neatly on Franklin D. Roosevelt's nose on the U.S. dime. The fantastic shapes and colors of the labellum or lip—a specialized and modified, often showy petal—certainly contribute to the mass appeal of orchids. The bold colors, virtually all but true black (yes, the black orchid immortalized in pulp fiction is only a myth) are enough to brighten the darkest of hallways, sometimes for weeks on end. The very adaptability of orchid species and hybrids, which makes them such ideal subjects for the windowsill, indoor light garden, or greenhouse, is hardly what you would expect from plants long mythologized as being fussy. And certainly the modest price tags now attached to orchids have made them accessible to everyone.

Not only are there 25,000 species, but some four times as many hybrids are registered with the Royal Horticultural

BY ALEC PRIDGEON



PHOTOS BY DICK KEEN

Phalaenopsis Abendrot

(above) is a noteworthy pink hybrid.

Paphiopedilum Maudiae

'Magnificum' (right) has an apple green pouch.

Society. Small wonder that the novice grower is often daunted. But what a pleasant predicament! All or most of the species and hybrids listed in this article have proven themselves over and over again through the decades for offering showy, long-lasting, brilliantly colored flowers at an affordable price. Some have hidden bonuses. For example, many grow so vigorously that they can be divided regularly, potted up separately, and shared with friends or relatives. Others flower twice or even three times a year and, since a given flower may last in perfection as long as six weeks and flowers may be produced in a long succession, may bless their grower with an abundance of flowers year round.

Cattleyas and their allies, arguably the most popular orchids, offer something for every taste and growing situation. The larger types respond best in a greenhouse, although many will thrive under lights or in a shade house. *Cattleya walkerana* has one of the most pleasant, potent fragrances in the orchid family. *C. mossiae*, a lovely, pink-flowered species from Venezuela, blooms reliably in the spring. *C. bowringiana*, on the other hand, blooms in the fall with up to twenty magenta flowers on each inflorescence. Hybrids of this species, particularly *C. Portia* and *C. Porcia*, put on spectacular shows in the fall. Some of the best bets for white-flowered hybrids are *C. Bob Betts*, *C. Joyce Hannington*, *C. Bow Bells*, and *C. Henrietta Japhet*.

(It is the custom to give orchid hybrids a capitalized name of their own. In the case of intergeneric hybrids, the names of the genera are combined and often abbreviated. Thus *Brassolaeliocattleya* becomes *Blc*. Following this convention, the orchid society and orchid catalogs abbreviate the intergeneric hybrid and many



OBSERVATION THE KEY TO GROWING ORCHIDS

The primary way in which orchids differ horticulturally from other plants is that most are epiphytes rather than terrestrials. Because in nature they grow on other plants, rather than in soil, their potting medium should be thoroughly free-draining; any water held around the roots for too long will soon cause them to rot. The most common media for potting epiphytic orchids are fir bark or tree-fern fiber, which is sold in three size grades: fine, for seedlings; medium; and coarse. Special mixes are also available, with various ratios of charcoal, redwood chips, and/or sponge rock added to either fir bark or tree fern. Sphagnum moss, osmunda, and rock wool are used to advantage with certain orchids. Some orchids have a growing habit that is best accommodated by potting in tree-fern or wooden baskets or by mounting on plaques of tree fern or cork.

As orchids occupy many ecological niches, it is difficult to generalize about cultural requirements. *Vanda* prefer high light intensity (minimum 2,500 foot-candles), while *Paphiopedilum* and *Phalaenopsis* thrive in lower light. A range of 2,000 to 2,500 foot-candles is fine for most orchids.

Temperature ranges are flexible to an extent. However, an orchid species that occurs naturally at an 8,000-foot elevation with cool nights will quickly succumb if transplanted to a hot environment at sea level. Orchids are customarily sold either for cool environments (55-60 degrees at night), intermediate (60-65 degrees), or warm (65-70 degrees). Usually classified as cool orchids are *Cymbidium*, *Masdevallia*, *Miltonia*, and *Odontoglossum*; even for these, hybridizers are now breeding in warmth tolerance by using warmer-growing species. At the warm end of the thermometer are *Phalaenopsis* and some *Paphiopedilum*. Intermediate temperatures are fine for most others. A differential of 10 degrees or so between daytime and nighttime temperatures seems to be necessary for best growth and flowering.

In general, those orchids with water-storage organs such as pseudobulbs will tolerate—some even require—drying out. However, those with no provision for long-term water storage, such as *Vanda*, *Ascocenda*, *Paphiopedilum*, and *Phalaenopsis*, should not dry out appreciably between waterings. When you do water, water copiously to make sure that the water drains through and flushes out any accumulated salts around the roots.

Liquid or powdered fertilizers should be applied regularly during active growth at the rate of one half to one teaspoon per gallon of water. For plants grown in fir bark use a 30-10-10 fertilizer; all others will do well with 20-20-20. Some successful growers fertilize with a cow manure “tea,” but in the home environment this would seem to discourage visits from friends or considerably shorten church socials. To prevent root burn, fertilize only immediately after watering.

Try to create a comfortable atmosphere around your plants by keeping relative humidity above 50 percent and by maintaining constant but gentle air movement. In the home this can be achieved by growing plants over water in gravel-filled trays and by running a ceiling fan or muffin fan, and opening a window whenever possible.

The key to successful orchid culture is simply regular observation to spot incursions by pests and diseases before they get out of hand. And don't be afraid to experiment, for moving an orchid just a few inches may mean the difference between health or decline, several flowers or none. In the end you'll find that orchids aren't fussy plants at all. Some even say that orchids thrive on neglect.

genus names as syllables, rather than a single letter, as is standard in botanical nomenclature.)

The complex *Cattleya* hybrids, those involving other genera, represent the pinnacle of breeding. Every color in the rainbow (except black and true blue) is here: the yellows of *Blc.* Malworth, *Blc.* Fortune, *Blc.* Erin Kobayashi; the greens of

Laeliocattleya Ann Follis, *Blc.* Greenwich, *Blc.* Ports of Paradise, and *Lc.* Leafwood Lane; the purples of *Blc.* Norman's Bay, *Blc.* Memoria Crispin Rosales, *Lc.* Adolph Hecker, and *Lc.* Bonanza; the startling reds of *Sophrrolaeliocattleya* Jewel Box 'Scheherazade', and *Slc.* Hazel Boyd. Last but not least are the semi-alba hybrids, those having white flowers with a red lip—

Lc. Stephen Oliver Fouraker, *Lc.* Mildred Rives—and the colorful splash-petal hybrids such as *Lc.* Prism Palette.

Orchidists with growing space only in south- or east-facing windows or under lights can enjoy the hundreds of miniature *cattleyas* bred over the years. *Cattleya* Small World is a primary cross, that is, one between two species (*C. aclandiae* and *C. luteola*). Another primary cross, between *C. aclandiae* and *C. loddigesii*, gave us *C. Brabantiae*, a little charmer with pink, maroon-spotted flowers. There are some absolutely delightful miniature *laeliocattleyas*, too, such as hybrids *Lc.* Love Knot and *Lc.* Mini-Purple, both of which thrive under lights and bloom twice or even three times a year. Their flowers are long-lived and exceptionally fragrant. Finally, put *Cattleytonia* toward the top of your list. These are crosses between *Cattleya* and *Broughtonia sanguinea*, with scarlet to magenta flowers about two inches or more in diameter. *Cattleytonia* Keith Roth, *Ctna.* Jamaica Red, *Ctna.* Rosy Jewel, *Ctna.* Why Not, and *Ctna.* Memoria Henry Goldberg are all recommended.

Another magnificent genus that should be represented in every collection is *Phalaenopsis*, the so-called moth orchids. The ideal house plants, they revel in south or east windows and under lights. Most flower in spring over several months. The skill of the hybridizer has given us pure whites, pinks, whites with red lips, bold stripes, spots, and again, almost every color except true blue and black. *Phalaenopsis schillerana* and *Phal. stuartiana*, both species from the Philippines, have been building blocks in the creation of some of our most appealing hybrids. Even out of flower, they are attractive because their leaves are dark green mottled with silver gray. *Phal. equestris* is another vigorous species from the Philippines. Its white flowers with rose and yellow lips appear variously throughout the year but chiefly in the spring and fall.

Virtually all *Phalaenopsis* hybrids can be recommended, but the following, listed by predominant flower color, are especially noteworthy: whites (*Phal.* Winter Maiden, *Phal.* Joseph Hampton); pinks (*Phal.* Abendrot, *Phal.* Lippegruss, *Phal.* Lippstadt); whites with red lips (*Phal.* Shirley Pendelton, *Phal.* Jean McPherson); stripes (*Phal.* Hausermann's Fireball, *Phal.* Kathleen Ai, *Phal.* Music); spots (*Phal.* Georges Seurat, *Phal.* Mouchette, *Phal.* Elise de Valec, *Phal.* Rousserole); novelties (*Phal.* Orchid World, *Phal.* Sweet Memory, *Phal.*

Suziana Wijanto, *Phal. Malibu Imp*).

Rivaling the cattleyas and phalaenopsis in popularity is *Paphiopedilum*, the slipper-orchids of tropical Asia. The lip is shaped like a pouch or slipper, which accounts for its common name. Many species and hybrids have mottled leaves, which make them attractive even out of flower. Flowers will appear once or even more often each year, and each lasts a month or more. Best of all, most will tolerate low light. Some species are ideal for home culture, notably *Paphiopedilum callosum*, *Paph. fairieanum*, *Paph. sukhalulii*, and *Paph. chamberlainianum*. If forced to select one species or hybrid that is perennially and generously rewarding, it would be *Paph. Maudiae*, which has three color forms: the *coloratum* (e.g. 'Los Osos') with a red pouch and red-suffused sepals and petals; the *album* (e.g. 'Magnificum') with an apple green pouch and white sepals and petals veined in green; and the *vinicolorum* or *vinicolor* (e.g. 'Ebony Queen'), a flower sometimes so dark purple that it approaches black. Other hybrids similar to *Paph. Maudiae* include *Paph. Makuli*, *Paph. Faire-Maud*, and *Paph. Vintner's Treasure*. Whatever *Paphiopedilum* you try first, it most assuredly will not be your last, for each is gifted with an alluring personality.

A few orchid genera, for example *Dendrobium* and *Oncidium*, have literally hundreds of species. Among the best choices in *Dendrobium*, which has well over 1,000 species, is *Den. lindleyi*, formerly known as *Den. aggregatum*, from India and Southeast Asia. Its butter yellow flowers are symmetrically arranged on a pendent inflorescence in spring and summer. Other winners are *Den. phalaenopsis* and its hybrids, such as *Den. Hicam Deb*. The white to purple flowers, which resemble those of the genus *Phalaenopsis*, last up to two months in perfection. Almost as long-lasting are the flowers of *Den. infundibulum* and *Den. formosum*, two species in a group characterized by hairy stems. Or try one of the "antelope" dendrobiums, such as *Den. antennatum*, with its upright petals resembling the horns of an antelope.

Oncidium, commonly called the "dancing ladies," are desirable for the showers of lemon yellow to brown flowers that many species produce. Bright light is necessary to flower *Onc. sphacelatum*, *Onc. splendidum*, and *Onc. stramineum*, but the extra effort is worth it.

If you can provide enough light to flower



Dendrobium antennatum



Sophrolaeliocattleya Hazel Boyd

*The very adaptability
of orchid species
and hybrids is hardly
what you would
expect from plants
mythologized as fussy.*



Dendrobium lindleyi



Rhyncholaelia digbyana

oncidiums (about 2,500 foot-candles), then you can also flower *Ascocenda*, smaller versions of the glorious *Vanda* orchids. Some of the most popular hybrids are *Asceda. Yip Sum Wah*, *Asceda. Meda Arnold*, and *Asceda. Peggy Foo*.

Many novices begin with *Brassavola nodosa*, the "lady of the night." Although the white flowers are not as showy as others, their lily-of-the-valley fragrance is heavenly. The somewhat related species, *Rhyncholaelia digbyana*, is justly famous not only for its fragrance but also for its large frilly lip that has contributed so much to cattleya breeding.

Beginners are also attracted to the *Encyclia* from Latin America for their unique shapes, floral longevity, and fragrance. One species from Mexico and Guatemala is *Enc. radiata*, which has a cockle-shell lip. Another winner is *Enc. cordigera* which has chocolate brown sepals and petals and a contrasting cream or rose lip. Both are remarkably fragrant.

Certain moth-pollinated species from Africa and Madagascar are also powerfully fragrant at night. These members of the genus *Angraecum* typically have white, cream, or greenish flowers with tubular, nectar-bearing extensions of the lip called spurs, which can reach to eighteen inches in some species. Particularly rewarding are *Angcm. leonis* and *Angcm. magdalenae*.

As with any other plant, buy orchids according to the environmental conditions you can provide. Any number of local nurseries or mail-order firms will be anxious to help you in deciding which of these "proven performers" or hundreds of others are best for your growing conditions. The *American Orchid Society Bulletin* is an indispensable monthly magazine full of color photographs and advertisements to help guide you in your selections. If you prefer species, insist that the plants be nursery propagated rather than wild collected; seed-grown plants are much more adaptable and finer in form than plants from nature.

Sources for orchids on page 38.

Dr. Alec Pridgeon is director of education and research of the American Orchid Society and long-time editor of the American Orchid Society Bulletin. For more information about the American Orchid Society, write to Membership Department AH, American Orchid Society, 6000 South Olive Avenue, West Palm Beach, FL 33405, or call (407) 585-8666.



Bamboos

To the average gardener, the word “bamboo” often elicits a vision of rampant growth, a fear that it will take over the garden. This is based on a little exaggeration and a good bit of misinformation. Most people think the weedy, giant reed *Arundo donax* is a bamboo, but it’s not. The average nursery sells only a few readily available species, often those least suited to small gardens. The most commonly sold species, golden bamboo, is also the most likely to spread rampantly. A proper choice of species, along with a strategy for control, will bring rich rewards with this most versatile ornamental plant.

Bamboos are members of the Poaceae, or grass family, which is also called Gramineae. They differ from other grasses in having woody stems and a leaf blade that narrows at its base to form a leaf stalk or petiole. Like other grasses, bamboos have principal, above-ground stems called culms, which are segmented by joints, or nodes, that separate their usually hollow internodes. A bamboo plant may consist of many or even hundreds of culms, all connected by a system of underground stems, or rhizomes.

About 1,000 different bamboo species have been described, along with an additional 1,000 varieties, forms, and cultivars. They occur naturally on all continents except Europe and Antarctica, from 46 degrees north latitude to 47 degrees south, and at elevations from sea level to 13,000 feet. Some are giant tree grasses like *Dendrocalamus giganteus*, whose culms are more than 100 feet tall and a foot thick; others are dwarfs that grow only a foot or two tall with culms less than one-eighth inch thick. Still others are vines that scramble over the ground or climb up the trunks of trees and hang down in a canopy

of leaves that steal the light of their hosts.

Bamboos can be classified according to whether their rhizomes are thicker or thinner than the culms that grow from them. A given species of bamboo will usually have either one type of rhizome or the other. Thin rhizomes are generally long and the culms growing from them are well separated, which produces a running bamboo. Thick rhizomes tend to be short and to produce culms that are close together; these are clumping bamboos.

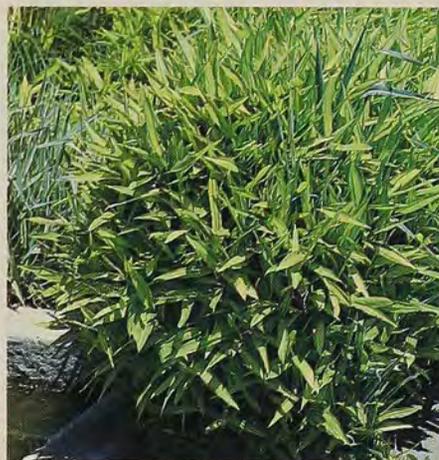
Since the type of rhizome determines the growth habit of the plant, it’s important to be aware of whether a species has a thick or thin rhizome before choosing it as a landscape plant. Running bamboos can be invasive. New culms can come up as far as fifteen feet from the mother plant, popping up in the middle of your perennial bed, your lawn, or even your neighbor’s. Clumping bamboos, on the other hand, will stay in a restricted area, maintaining a more acceptable behavior for the small garden.

Running bamboos usually require some control and more maintenance than the clumpers. These are plants for active, not armchair gardeners. The payoff is a plant that grows noticeably, often more rapidly than any other. Also, most runners tolerate a wide range of climates, both hot and cold.

Bamboo culms sprout from their rhizomes in a rather brief period, called the grand period of growth. During this time, which usually lasts no more than two months of the year, the culms grow to their full height and diameter. After that, they grow little if any, even though they may live another five to ten years. The culms of most running bamboos shoot in the spring, while clumpers shoot in late summer. The new shoots can be used as a vegetable if they are harvested before they emerge from the ground.

In the United States, bamboos are used

BY RICHARD HAUBRICH



ANITA SABARESE

Sasa veitchii (left)

is a favorite dwarf.

Golden bamboo (above)

is invasive, but a good

choice for containers.

BAMBOO CULTURE: EXCEPTIONS TO EVERY RULE

Bamboos do best in sandy loam soil. They will tolerate and even thrive in clay soil with adequate drainage, although some of the runners may not spread in heavy soil. A few species are somewhat drought tolerant; Buddha's belly bamboo (*Bambusa ventricosa*) can go a month or two without watering. Most plants will look better, however, if watered at least once a week during periods of no rain. Most bamboos prefer a pH around 6. They will tolerate alkaline soil but some, like black bamboo and *Shibataea kumasaca*, will exhibit leaf tip browning. Bamboos respond to high nitrogen fertilizer. Fertilize three times a year, in spring, summer, and fall, or better still, apply monthly low concentrations of nitrogen and include phosphorous and potassium only once or twice a year.

Running bamboos can be controlled by erecting an underground barrier that extends from a few inches above the soil surface to about thirty inches deep. An eighteen-inch depth is sufficient for small species. The barrier can be made of concrete, sheet metal, or heavy plastic, just as long as all the joints are tight, since the rhizomes can push through small cracks. Runners can also be controlled by cutting new culms to the ground when they shoot in a place where they are not wanted. Small species that move into a lawn can simply be mowed.

Because seed is rare, bamboos are usually propagated vegetatively. Although some species can be propagated from culm or rhizome cuttings, you will be most successful if you simply divide the plant so that each division includes a rhizome with three or more culms attached along with some of their leaves. The culms can be topped and some branches and leaves removed to prevent stress on the plant caused by the division. The best time of year to divide plants is just before the annual shooting—early spring for runners, early summer for clumpers.

Bamboos do well in pots. In cold climates, bury the pot. Since most bamboos will soon grow to fill the pot, they should be taken out of the pot about once a year to trim back the rhizomes and culms to allow room for new growth.

Occasional pests found on bamboo are scale, mealy bugs, spider mites, and aphids. They may be unsightly but appear to do little harm to the plant.

as ground covers, screens, hedges, and specimen plants but can also provide food, poles, and erosion control. Bamboo foliage remains green throughout the year except in extreme cold or drought.

Bamboo flowers are usually inconspicuous and for most species, appear rarely—once in thirty to 100 years. Some are monocarpic: they flower once, then die. When a few flowers appear sporadically on a plant, they have no visible effect on its growth. Massive flowering, however, causes the plant to stop all vegetative growth and drop its leaves. It may remain in this state for years, after which it may or may not recover vegetative vigor. In any event, it is best not to buy a plant in flower. Bamboo flowers rarely produce viable seed.

Over 200 species of bamboo are now cultivated in the United States. About half of these are available from commercial, specialty nurseries. The rest are in botanical gardens, private collections, or under development in nurseries. The bamboos are usually divided into five groups according to size and growth habit.

Dwarf Runners

Most of the dwarf runners are hardy bamboos native to Japan. They range in height from six inches to about eight feet. A favorite because of its large green and white striped leaves is dwarf whitestripe bamboo (*Pleioblastus variegatus*), which maintains its leaf color all year. The leaves of *P. viridistriatus*, on the other hand, fade to a greenish brown in fall and the culms tend to die back in winter. The old culms can then be cut to the ground. In spring new culms bearing bright yellow leaves with green stripes will come up from the rhizomes. *Sasa veitchii*, another favorite dwarf, has large, dark green leaves that turn white along their margins in fall. Another is *Shibataea kumasaca*, whose leaves are unusually wide for a bamboo. It prefers acid soils and will show leaf burn under alkaline conditions.

Ornamental Clumpers

These clumping bamboos, which grow at most to about twenty feet tall, have a wide range of uses in landscaping because of

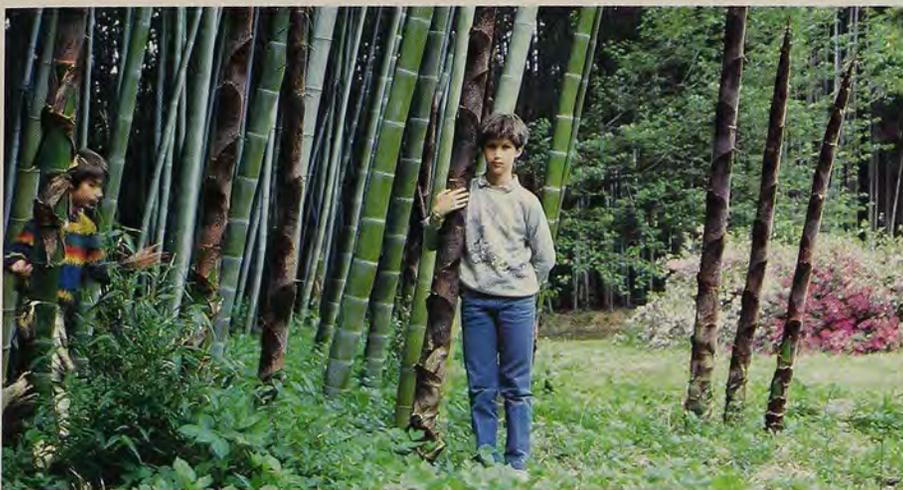
their noninvasive growth habit. Their culms arch strongly outward from the clump, producing a fountainlike effect. Those gardening in cold climates can choose fountain bamboo (*Fargesia nitida*), which has bluish, dark purple culms, or umbrella bamboo (*F. murielae*), whose culms are green. These two species, both native to the mountains of China, are among the hardiest bamboos known. The leaves usually stay green in winter down to about 20 degrees below zero, but unseasonal cold snaps can produce some defoliation at higher temperatures. Not surprisingly, they do not do well in hot or desert climates.

Two attractive bamboos for a mild climate (not below 15 degrees and not too hot) are *Drepanostachyum hookerianum* and *D. falcatum*. The first has culms striped with green, yellow, and lavender pink. The latter has bluish purple culms.

For hot climates and deserts (not below 20 degrees), my favorite is Mexican weeping bamboo (*Otatea acuminata* subsp. *aztecorum*). Its long narrow leaves are produced in such abundance that they almost obscure the culms. It is somewhat drought tolerant but grows faster when watered. Another bamboo of this group for hot climates (down to 15 degrees) is hedge bamboo (*Bambusa multiplex*). It comes in several forms, from dwarf to giant. The larger ones can be trimmed to any desirable size. Chinese goddess bamboo (*B. multiplex* var. *riviereorum*) is a dwarf form with tiny leaves; it grows about six feet high. Another dwarf, *Bambusa multiplex* 'Stripestem Fernleaf', has culms striped in yellow, green, and magenta.

Medium Size Runners

These grow from ten to about thirty feet tall. Most are hardy to 0 degrees and some to 10 below or less with little damage. They grow best in full sun, and are not bothered by heat. The most commonly available species is golden bamboo (*Phyllostachys aurea*). It is also the most invasive. It should not be planted in the ground by those without the time and experience to give it the attention it deserves. However, it is a good choice for pots and tubs. A favorite bamboo among those who have seen it is black bamboo (*P. nigra*). The culms turn jet black in striking contrast to the abundant, rather small, emerald green leaves. In either hot or cold climates, it usually grows no more than ten feet tall, but in the mild climate of the Pacific Northwest, the culms may exceed thirty-five feet. The hardiest



Moso bamboo (above) is the largest of the giant runners. Mexican bamboo (below) is a good choice for hot climates.



species of this group are *P. aureosulcata*, *P. bissetii*, and *P. nuda*. The latter has attractive dark green culms with bands of white powder circling the nodes. In cold climates, it grows taller than other bamboos.

Giant Tropicals

These are clumping bamboos hardy to about 15 degrees. They do best in full sun in areas with long summers. The most commonly grown species is *Bambusa oldhamii*. Its large leaves and straight, erect culms, up to four inches thick and more than forty feet tall, make it an exceptionally beautiful specimen plant. *B. beecheyana* is a massive bamboo whose culms arch outward from the clump. The prominent nodes, separated by short internodes that are covered with white powder, give the plant an exotic appearance. *B. textilis* is not so large, but it is unsurpassed by the sheer beauty of its foliage. The culms, which are thin walled but strong, are used in Asia for weaving baskets. *B. vulgaris* has a cultivar, 'Vittata', whose culms are golden yellow marked with green vertical stripes. Though hardy only to 28 degrees, it can be grown indoors in pots if given enough light.

Giant Runners

The largest bamboos cultivated in the continental United States are runners belonging to the genus *Phyllostachys*. They are capable of forming a forest of culms fifty to seventy feet tall. They do best in full sun and are hardy to about 0 degrees. *P. bambusoides* is prized for its tall growth and fine wood, often used to make bamboo flutes. *P. vivax* is the hardiest of this group, down to 10 degrees below zero. It is valued for its vigorous growth and attractive foliage on culms that arch gently near their tips. *P. nigra* 'Henon', a form of black bamboo whose culms remain green, grows over fifty feet tall. Another favorite is *P. viridis*, especially 'Robert Young'. Its culms quickly turn yellow with occasional green vertical stripes. The largest species of this group is moso bamboo (*P. heterocycla* var. *pubescens*). Valued for its edible shoots, it has not been widely planted in the United States. It is slow to become established, and gophers love to eat the rhizomes.

Richard Haubrich, a founding member and past president of the American Bamboo Society, edits the society's newsletter. For information about the society and a list of sources, write to the American Bamboo Society, P.O. Box 640, Springville, CA 93265, (209) 539-2145.

Begonias

Three hundred years ago in 1690, Charles Plumier, a Franciscan monk and botanist collecting plants in the French Antilles, discovered that six of the plants he had collected didn't fit any known plant description. Imagine his surprise and delight! He had discovered a new family of plants!

Accorded the privilege of discovery, Plumier named his new plants Begoniaceae, after his patron Michel Begon, the governor of French Canada. Today there are almost 4,000 species and hybrids of Plumier's plant family in cultivation. These wonderful, varied plants have many leaf shapes and sizes, seemingly endless leaf colors, and patterns that sparkle like jewels, evoking expensive brocades. Some begonias creep along the ground while others will reach six feet and more. Some bloom constantly, others rarely bloom, some are grown only for their flowers, while others are grown for the beauty and character of their leaves.

The American Begonia Society classifies begonias according to similarities of structure and cultural requirements.

Cane

The angel-wing begonia that your grandmother grew falls into the cane group. Canes have erect, smooth, bamboolike stems with swollen nodes. Often their leaves are shaped like angel wings. Most do not branch freely but send up shoots from the base of the plant. Leaf color can vary from very dark to pale green to mahogany or even cherry red. They may be splashed, streaked, or dotted with silver or white. Most leaf surfaces are glossy, although they may have a satin sheen or a dull surface. Textures range from papery to leathery.

BY LORRA ALMSTEDT



PHOTOS BY LORRA ALMSTEDT

The "Non-Stop" series (above) tolerates more heat and drought than other tuberous begonias.

The leaves of 'Magic Carpet' (right) are covered with fine red hairs and sprout adventitious leaflets.

Canes are large plants. In pots they remain at one to six feet, but planted in the ground they can reach a height of fifteen feet or more. Clusters with up to fifty flowers appear in spring and summer in all shades of red, pink, and white. They benefit greatly from tip pruning, in which thumb and forefinger are used to pinch out the leaf that is just unfolding, and a heavy yearly pruning.

Cane begonias are very popular. Beautiful, hearty, and among the easiest to grow, they should be the first begonias a beginning grower tries.

'Irene Nuss' and 'Sophie Cecile' are two of the best of the tall canes. They make excellent container plants and will often reach four or five feet when grown in a large redwood container. 'Sophie's' mature leaves are seven to eight inches long, deeply cut, and deep green streaked in silver with dark maroon undersides. 'Irene's' leaves, not as deeply cut, are a lighter green with a satin sheen.

They both have large clusters of pink flowers. 'Irene' will bloom from May to November. 'Sophie's' blooming season is shorter, starting in July. 'Sophie' will sometimes be reluctant to bloom if it does not receive about six hours of early morning and late afternoon sun. (If your summer is hot, make this six hours of bright indirect light.) 'Sophie Cecile' was voted the best of the "Classy Canes" by the American Begonia Society in 1981.

'Pink Rubra' is an outstanding canelike begonia. Flowers and clusters are small, but the plant will be covered with them. 'Lois Burks' is a relatively new introduction but growing fast in popularity. Hybridized by Patrick Worley of California, it is a miniature cane, reaching about two feet. It branches easily making a full plant. Flowers are orange and appear all



MAKING BEGONIAS FEEL AT HOME

Begonias are grown the world over in every conceivable way: on the window-sill, under lights, in the greenhouse, planted out in the garden, in terrariums, or under lath on the patio. Yet they are all shade plants that require bright mottled light, evenly moist soil, a consistent diet of fertilizer, and a devoted grower. They respond to lots of TLC!

When you understand their requirements, begonias are an easy group of plants to grow. They evolved in tropical undergrowth, protected from direct sunlight by the canopy of a tropical forest. Follow the rules for growing in the shade; otherwise the plants will become stressed, and will not achieve their potential beauty.

Light requirements and temperature are tied together. For example, if a begonia is grown cool—between 65 and 75 degrees—it can take almost full sunlight, but when grown warmer—between 80 and 90 degrees—sunlight must be filtered 40 to 50 percent. The higher the growing temperature, the more shade the plant will require. Many of the canes and shrubs bloom best with some direct morning or late afternoon sun.

Although their native environment is very humid, begonias will tolerate a wide span of humidity if their other cultural requirements are met. But they cannot tolerate any frost. Where winters are cold, plants must be moved into protected areas. In areas with occasional frost the tops of the plant will die, but most will return from the roots in spring.

In their natural habitat begonias grow in a rich, porous, well-drained soil. In cultivation we must try to duplicate these conditions in our growing medium. A popular mix is two parts leaf mold, two parts good commercial potting mix, two parts shredded redwood, and one part #3 one-eighth-inch diameter sponge rock.

Also remember their natural environment when watering. Water like a torrential rain, then allow the plant to become dry—not bone dry, but to a “dry on top” stage—before watering again.

Under the forest canopy, begonias must stretch for light. This makes them leggy and they tend not to branch freely. In cultivation we compensate for this by tip pruning. A single tip-pruned branch will make two new shoots: tip-pruned again it will make four, then eight, and so on until the desired fullness is achieved. Stop pruning at this point to allow the plant to bloom. The reward is a show plant exceeding all others.

Begonias, especially canes and shrubs, benefit from a yearly cutting back in early spring. Remove any dead, old, or crossed branches. Use this pruning to shape the plant by cutting outside branches shorter than those in the center of the plant.

In the spring when begonias begin to grow they are voracious feeders. Fertilize every time you water. Use a high-bloom fertilizer at the rate of one-fourth teaspoon per gallon of water. Fertilize nine times with this, then on the tenth time use clean, fresh water to flush away any accumulation of residual salts.

Begonias are very easy and rewarding to propagate. All types can be started with tip cuttings. Be sure there is at least one node buried in the potting mix and tip pinch the cutting after it has three sets of new leaves.

Rex and rhizomatous begonias can also be started with leaf cuttings. A whole leaf can be used or it can be cut into wedges. Each wedge must have a vein in it. Place the tip of the wedge in the growing medium and keep it moist and warm, with good light. In about ten days small plants will appear at the soil line.

year. Leaves are a fresh, bright green spotted with silver.

Another favorite cane is ‘Looking Glass’, also from Worley. This plant rarely blooms but it doesn’t have to. Its leaves are pure silver on top, deep red on the undersides with deep, dark green veins. Mildew can be a problem because it is hard to see

on the silver foliage. Other great canes to try are ‘Nokomis’, ‘Pink Jade’, ‘Lana’, ‘Star Frost’, and ‘Kristy’.

Shrub

Shrub begonias are lush, full plants that produce shoots from the base and branch freely, especially when they are tip pinched.

Leaves vary in shape and in size, from less than one inch to more than eighteen inches across. They can be glossy or dull, have a satin sheen, or be so hairy they are termed “felted.”

Most shrub begonias are seasonal bloomers—for every season there are varieties in bloom. Flowers are most often pink, white, or cream, although a few varieties have yellow, salmon, or peach flowers.

For ease of culture and adaptability ‘Richmondensis’ is probably the most valuable begonia. It makes a superior basket or wall-pocket plant, can be used for bedding, mixes well with other plants, and makes a lovely border. It can be found in almost any garden center.

‘Richmondensis’ can vary dramatically from one growing environment to another. If grown primarily in shade, it will be a lush green with large pink and white flowers. When grown where it receives several hours of sun, leaves and flowers will be smaller, the backs and edges of leaves will turn red, and flowers will be all pink. If grown in full sun its leaves will be a deep bronze red with red flowers. Growth habit will be shorter and denser.

Begonia ‘Eunice Gray’ is a freely branching plant that makes an excellent hanging basket specimen—easily becoming a three-to-four-foot ball of foliage. Its leaves are bright shiny green, always looking wet, and are of a medium size. Flowers are white and appear throughout the year.

‘Midnight Sun’, a Logee hybrid, is a shrub begonia with distinctive foliage. The leaves in the center of the plant are translucent pink with green veins and rosy red undersides; the outer leaves are moss green. ‘Magic Carpet’ also has distinctive foliage. The leaves are dark green on top, red underneath, and covered with red hairs. It gets its name from the numerous adventitious leaflets that appear on its leaves.

B. luxurians, the palm-leaf begonia, is a large, regal plant with huge umbrellalike leaves. Other shrub begonias to look for are ‘Ginny’, with small hairy leaves; *B. foliosa*, a species that is called the fern begonia; and ‘Medora’, a popular favorite that always wins a ribbon when entered in shows.

Rhizomatous

Rhizomatous is the largest group of begonias—including more than 1,000 species and hybrids—and the most varied. Noted primarily for their beautiful and interesting foliage, these plants have a thickened stem that most often grows along the ground

with the leaves growing out from it.

The diversity of leaf shapes and color patterns found in the leaves make rhizomatous begonias exciting to grow. Think of a leaf color, texture, or shape and there will be a rhizomatous begonia to match it. The flowers, which appear in midwinter to late spring in shades of pink and white, may be embedded in the foliage, slightly above it, or on stalks that rise several feet into the air.

The key to success with rhizomatous begonias is to not overwater them. The rhizome is subject to rot if kept too damp.

Of the giant-leafed rhizomatous begonias, 'Freddie' is one of the most popular. Leaves, which can easily measure fifteen inches, are thick and leathery with red hairs around the edges and down the stems. The flowers are huge clusters of tiny pink flowers held high above the foliage in late summer.

One of the oldest rhizomatous begonias is 'Erythrophylla', dating to 1845. It's often called the beefsteak begonia because of the red coloring on the underside of its leaves. 'Cleopatra' is another easy and popular rhizome begonia to try. It's a compact grower with brown and chartreuse leaves and makes a good basket plant. 'Connie Boswell' is a fairly recent introduction with deeply cut, distinctive foliage. The overall color is silver, bordered in lavender pink with dark veins; the flowers are pink.

B. prismatocarpa is a lovely small-leafed rhizomatous begonia with everblooming yellow flowers. It needs high humidity and makes a wonderful terrarium plant. *B. masoniana* has distinctive apple green, puckered foliage with brown markings in the form of a German iron cross.

Semperflorens

Semperflorens means always-blooming—an appropriate name for this group of begonias. They go by the common names of fibrous, wax, or bedding begonia and are the most popular of all. Almost 300 million semperflorens begonias are sold as bedding plants annually.

Introduced by accident into the Berlin Botanical Garden in 1821, this group of begonias has benefitted tremendously from hybridization. They all grow readily, sending up numerous basal shoots, making full compact plants with erect succulent stems.

Leaves are smooth and glossy in numerous shades of light to dark green, bronzy red, dark mahogany, or variegated with cream and white—some are such a dark bronze they are called chocolate.



PHOTOS BY LORRA ALMSTEDT

*'Looking Glass' (top),
is a cane with silver
leaves. Begonias can be
striking when grouped
together (bottom).
'Linda' is in
the center of the bird
bath, and 'Pink Comet'
in the foreground.*

Flowers may be single, semidouble, or so double they look like pom-poms. Colors range from white to pink through deep wine red; some are even bicolor.

As a semperflorens begonia grows, its old leaves will lose their luster, die, and fall off, leaving the plant looking leggy and straggly. When this happens check the plant over carefully; if there is new growth showing in the form of side shoots or basal growth, remove the old stem at the base of the plant or to the desired side branching. If there is no evidence of new growth, pinch out the tip growth and wait for new growth to appear before removing the old growth. Cutting the plant back when there is no new growth often causes it to die.

Semperflorens are so easy to grow that if color bowls you over and you aren't using them in your landscape you are missing a rewarding garden experience. They are also the easiest begonias to find. Many are grown commercially as bedding plants. Named varieties to look for include 'Viva', a wonderful and versatile plant with green leaves and white flowers. Its leaves do not turn red when grown in the sun as do those of many begonias. 'Scarlatta' has a vivid red flower with green leaves, and 'Linda' has pink flowers.

One of the more unusual semperflorens not grown commercially is 'Christmas Candy'. This plant has the vigor of a semperflorens and the delicate beauty of an Argentine species. It has profuse, bright red flowers that contrast nicely with succulent green leaves. When grown in bright light it is never without flowers. It becomes a beautiful, rounded basket plant when pinched diligently.

'Charm' has green leaves with golden cream patches. Flowers are light pink. 'Pink Avalanche' makes an excellent basket plant and can be identified by the hairs that grow along its stems. 'Glamor Picotee' makes a great bedding and container plant.

Also, try any of the pom-pom flowered varieties with green or bronze leaves. Look for names like 'Pink Camellia', 'White Christmas', 'Lady Frances', and any of the "Ruffles" series with red, white, or pink balls of bloom on green, ten-inch plants.

Rex

The rex begonia fascinates people. In her catalog of 1911, Theodosia Shepherd described the rex begonia as having "...the radiance and brilliancy of precious jewels, the shining luster of metals, with the beautiful colors, and textures of the most costly fabrics. The leaves alone possess all



Begonia masoniana is often called iron cross because of its distinctive leaf markings, which are puckered like seersucker.

these charms, while the dainty flowers add lightness and grace."

This is even more true today than it was in 1911. Hybridizers have created breathtakingly beautiful plants in recent years—to the point that it is hard to believe that they are really living plants.

Rex begonias look delicate and in some cases they are, but don't be afraid to try them. The successes some growers are having is amazing.

Any of the rexes are a treat to grow. 'Fireworks' has large leaves with wine red veins blending into silver. The leaves on 'Merry Christmas' are a satiny red outlined in bright green with velvet red centers. 'Fireflush' is one of the finest and oldest rexes, coming from France in 1866. The

entire leaf is covered with red hairs, and the new leaves look and feel like red velvet. 'Tahara' has feather-shaped leaves of purple speckled and splashed with silver and green. The species that started it all is *B. rex*. The large leaves are a medium olive green with a wide band of silver and an olive green center.

Trailing-Scandent

The trailing-scandent group is the smallest, with only about fifty plants grown primarily by collectors. Either trailing from hanging baskets or climbing poles, they branch freely and send up many basal shoots making full, lush plants. Stems are long and flexuous and can reach eight or more feet. Most are seasonal bloomers.

One of the easiest and most popular of the trailing begonias is the species *B. glabra*, first described in 1775. Its leaves are heart shaped and light green, the flowers are white. 'Marjorie Daw', from 1898, is the oldest trailing cultivar still being grown; its flowers are a medium red.

A recent introduction is 'Orococo', a Worley hybrid with distinctive foliage. The leaves are glossy, pebbly, ivy shaped, and colored a golden green with deep red edges shading into the leaves. Sprays of delicate white flowers appear in summer. It is a sturdy grower that does well in low light.

Tuberous

Tuberous begonias have the largest, showiest flowers of all the begonias and are grown only for their flowers. In 1988, a world record was set in Scotland with a flower that measured thirteen and one-eighth inches in diameter. The flowers come in all shades of pink, red, orange, yellow, and combinations of these.

If you live in a climate with a damp and comfortably warm growing season—72 to 78 degrees—you will be able to grow magnificent tuberous begonias. The rest of us will have to be satisfied with plants that

perform only tolerably. Tubers are more temperamental than other begonias about temperature and will drop flowers and leaves when they are not happy. Tuberous begonias grow from a bulblike tuber and must have a definite period of winter dormancy.

Generic tubers can easily be found at nurseries and garden centers. If you can give them their ideal growing environment, search out some of the named varieties for show-stopping plants. In recent years, hybridizers have worked hard to produce tuberous begonias that tolerate a warmer and drier growing environment. The "Non-Stop" series, introduced about eight years ago, is the best available to date. This series has smaller flowers but in larger quantities than most tubers.

Thick-Stemmed

Thick-stemmed begonias have stout stems that are evident in the early stages of growth. Begonias in this class are rarely seen outside of collectors' gardens. They cannot be called beautiful or lovely, but they are intriguing and unusual. They have a particular appeal when grown in a bonsai style. Interesting ones to look for are *B. parilis* 'Tim O'Reilly', 'Rudy', 'Houston', and *B. vitifolia*.

If you're a gardener who likes trying the different and unusual, or if you would just like to grow an eye-catching conversation piece, give begonias a try—you will not be disappointed. But, be forewarned, it's not unusual for begonias to become addictive.

Lorra Almstedt is an eighteen-year member of the American Begonia Society and research librarian of its national board. Information on the location of branch meetings, membership in the American Begonia Society, and a subscription to its publication The Begonian can be obtained by contacting membership secretary John Ingles Jr. at 157 Monument, Rio Dell, CA 95562-1617, (707) 764-5407.

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Hoosier Orchid Company, 8440 West 82nd Street, Indianapolis, IN 46278.

Jones & Scully, 18955 S.W. 168th Street, Miami, FL 33187.

Kensington Orchids, 3301 Plyers Mill Road, Kensington, MD 20895.

Oak Hill Gardens, 37 West 550 Binnie Road, Dundee, IL 60118.

Stewart Orchids, 3376 Foothill Road, P.O. Box 550, Carpinteria, CA 93013.

Sources for Begonias

Davidson-Wilson Greenhouses, Rural Route 2, Box 168, Dept. 22, Crawfordsville, IN 47933. Catalog \$1.

Kartuz Greenhouses, 1408 Sunset Drive, Vista, CA 92083. Catalog \$2.

Lauray of Salisbury, 432 Undermountain Road, Route 41, Salisbury, CT

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Logee's Greenhouses, 141 North Street, Danielson, CT 06239. Catalog \$3.

Sunshine State Tropicals, P.O. Box 1033, Port Richey, FL 34673. Catalog free.

Unusual Plants, 10065 River Mist Way, Rancho Cordova, CA 95670. Quarterly newsletter \$4.

Vicki's Exotic Plants, 522 Vista Park Drive, Eagle Point, OR 97524.

CORNELIAN CHERRY

—PRETTY AND TASTY

A fresh look at a fruit enjoyed by the ancients.

BY LEE REICH

One summer day, I happened upon and began eating cornelian cherries (*Cornus mas*) from a tree in New York City's Central Park. I had to assure a concerned passerby that I was not experimenting with a possibly poisonous new food, but was partaking of a fruit that has been enjoyed by humankind for the past 7,000 years. At a site in northern Greece, early Neolithic peoples left traces of their meals of cornelian cherry, along with remains of einkorn wheat, barley, lentils, and peas.

Cornelian cherry now is grown almost solely as an ornamental in America and

most of Europe, but the fruits were well-known to the ancient Greeks and Romans, and references to the plant abound in their literature. Speaking of the Golden Age in *Metamorphosis*, Ovid wrote:

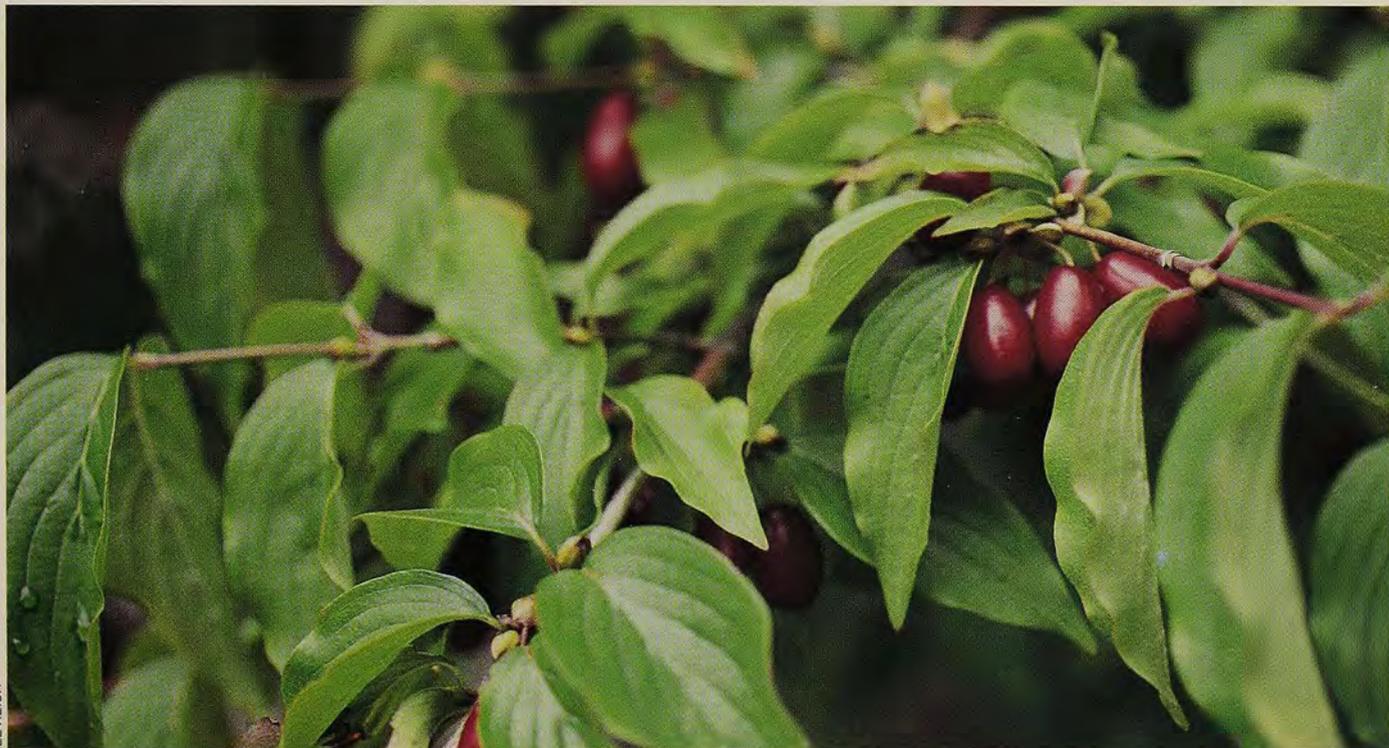
And Earth, untroubled,
Unharried by hoe or plowshare, brought forth all
That men had need for,
and those men were happy
Gathering berries from the mountain sides,
Cornel cherries, or blackcaps, and edible acorns.

The plant was grown in monastery gardens of continental Europe through the Middle Ages and the fruit was found in European

markets up to the end of the nineteenth century. Today the plant still is grown for its fruit in certain regions of eastern Europe and western Asia. Baskets of kizilcik, as the Turks call the fruit, are found in markets of Istanbul. The fruits are harvested from back yard trees in gardens of Moldavia, the Caucasus, Crimea, and the Ukraine.

Botanically, cornelian cherry is a species of dogwood, unrelated to grocers' cherries. The word "cornelian" refers to the

This article will appear in Uncommon Fruits Worthy of Attention: A Gardeners Guide by Lee Reich, to be published in March by Addison-Wesley Publishing Co.



Cornelian cherries are still grown for their fruit in eastern Europe and western Asia.



LEE REICH



DAVID M. STONE: PHOTONATS

Top: Wild *Cornus* *mas* varies greatly in fruit color. Bottom: Flowers appear just before forsythias blossom.

similarity in color of the fruit to cornelian quartz, which has a waxy lustre and a deep red, reddish white, or flesh red color. (*Carnis* is Latin for flesh.) Though the fruits are rarely eaten today, they do not go unnoticed as they festoon the tree in summer. Fruits generally are cherrylike in appearance: oval, fire engine red, with a single, elongated stone. The flavor, too, is akin to that of a cherry—a tart cherry—somewhat austere when the fruit first colors, but developing sweetness and aroma with full ripeness.

The plant grows to a maximum height of about twenty-five feet, becoming a large shrub or an oval-headed tree usually branching near the ground. In full sun the branches are largely upright, whereas in shade the branches spread wide, as if to better embrace the limited light available. Though the cornelian cherry never grows large, it is a long-lived plant that produces bushels of fruit into old age. In *Arboretum and Fruticetum*, John Loudon wrote that during travels in Germany in 1828, he and his companions “were shown, in the grounds of the Castle of Heidelberg, the famous cornelian cherry trees which were planted there in 1650.”

In winter, you’ll notice the plant from a distance for its rounded form. Step a bit closer to appreciate the bark, flaking off in muted shades of tan and gray. Get right up to the plant to see the distinctive flower buds, perched atop short stalks.

Flowers appear on leafless branches early in the season, just before forsythias blossom. Individual flowers are tiny, but are borne in such profusion that the whole tree appears swathed in a yellow veil. The effect is all the more striking against a backdrop of a dark wall or evergreen plant.

Many nurseries offer cornelian cherry seedlings, but the few named cultivars available reflect the plant’s use as an ornamental rather than a comestible. ‘Golden Glory’ is an upright, columnar plant with especially dark, green leaves, and ‘Nana’ is a cultivar diminutive in stature and leaf size. Variegated leaves of ‘Elegantissima’ and ‘Variegata’ make for brighter looking plants throughout the summer. Occasional leaves of ‘Elegantissima’ are completely yellow or have tinges of pink. ‘Variegata’ has irregular, creamy white leaf margins.

Other names reflect the ornamental qualities of cornelian cherry fruit. ‘Macrocarpa’ is notable for its large fruit and ‘Alba’ for its white fruit. Fruit of ‘Flava’ is large and yellow, and a whit sweeter than fruits of most other cultivars.

Variation in fruit colors is not limited to cultivars. If you were to wander into a Macedonian or Bulgarian forest where the plant is native you would find within the wild population plants that bear barrel-shaped or pear-shaped fruits, and others with fruits more than an inch long. In color, the spectrum runs from cream-colored to yellow, orange, fire engine red, dark red-violet, and almost black. And were you to taste fruits from a number of trees, you would find similar variations in flavor. The sugar content of cornelian cherries ranges from 4 to 12 percent, and acidity ranges from 1 to 4 percent. Their vitamin C concentration averages twice that of oranges.

If fruit qualities such as large size and a congenial blend of sweetness and acidity could be bred into a single plant, the result would be a highly ornamental plant bearing especially delectable fruit. As things now stand, fruits of run-of-the-mill seedlings are quite good, and superior fruiting wild plants have been selected but are as yet unavailable from nurseries anywhere.

Cornelian cherry is easy to grow. The tree is not finicky as to soil, transplants easily, and once established grows at a moderate rate. For best fruiting, plants need full or nearly full sun. Cornelian cherry is adapted to USDA Hardiness Zones 4 through 8, but languishes some in the southern part of this range. At its extreme northern limit, fruiting is risky, since the flower buds are hardy only to the colder portions of Zone 5. In contrast to the flowering dogwood (*C. florida*), cornelian cherry is little affected by any pests.

Seed is the usual mode of propagation. Germination may be delayed until the second season, although this tardiness could be overcome either by nicking the seed coat with a file or by subjecting the seeds to warmth and moisture for four months and then a one- to four-month period of cool, moist stratification. Seedlings must be at least six years old—sometimes they wait even until their teens—before they begin to fruit.

If only cornelian cherry cuttings rooted

Sources of Cornelian Cherry

Alexander Eppler Ltd., P.O. Box 16513, Seattle, WA 98116-0513 (for select clones).

Edible Landscaping, P.O. Box 77, Afton, VA 22920.

Northwoods Nursery, 28696 South Cramer Road, Molalla, OR 97038.

Southmeadow Fruit Gardens, Box SM, Lakeside, MI 49116 (free price list).

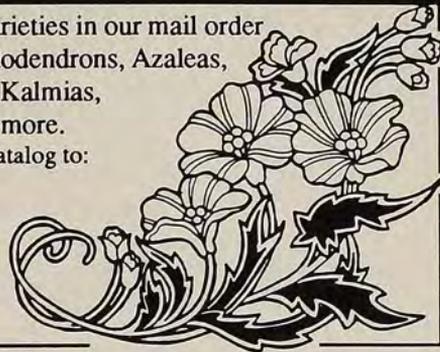
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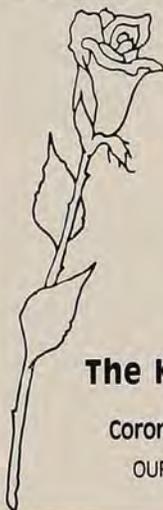
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as easily in reality as in myth. Legend has it that Romulus marked the site for the ancient city of Rome by thrusting his spear, made from cornelian cherry wood, into the ground. "No less amazed was Romulus when he saw the spear he planted suddenly put forth leaves" wrote Ovid, in *Metamorphosis*. Under optimum conditions 50 percent of softwood cuttings might root, though the percentage varies from clone to clone. The best time to take softwood cuttings is in late July or early August.

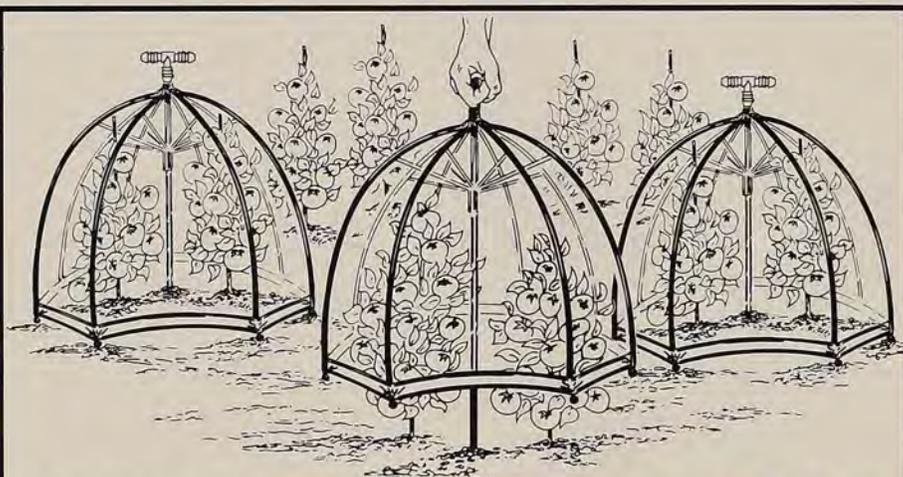
The harvest of cornelian cherries may begin anytime from late summer to fall, again depending on the clone being grown. Fruits from even a single tree ripen over an extended harvest period. The simplest way to harvest in quantity is to periodically give the branches a gentle shake once the fruit has colored, then collect fallen fruit from the ground. Ripe fruits left to hang on the tree become more concentrated in flavor and sweetness. Some people prefer to allow harvested fruits to sit at room temperature for a day or more, in which case the flavor becomes sweet, but more sedate.

Cornelian cherry fruits are a favored ingredient of Turkish serbert, a fruit drink sold in stores and from portable containers carried like knapsacks on the backs of street vendors. (Another common English name for cornelian cherry is "sorbet," although cornelian cherry is not the only fruit used for the Turkish serbert.) In the Ukraine, cornelian cherries are juiced, then bottled commercially into soft drinks. There, the fruits may also be made into preserves, fermented into wine, distilled into a liqueur, or dried.

When the fruit was popular in Britain, it was rarely eaten out of hand, probably because better-tasting varieties were unknown there. The fruits were held in high esteem for the delicious tarts they made, and shops commonly sold *rob de cornis*, a thickened, sweet syrup of cornelian cherry fruits. The juice was also used to add pizzazz to cider and perry, a fermented beverage made from pears.

Cornelian cherry is a pest resistant, hardy, and ornamental tree as worthy of cultivation for its fruit today as it was three centuries ago when John Parkinson wrote, in *Paradisi in Sole*, that "by reason of the pleasantness in them when they are ripe, they are much desired...also preferred and eaten, both for rarity and delight..."

Dr. Lee Reich is a horticultural writer and consultant who lives in New Paltz, New York.



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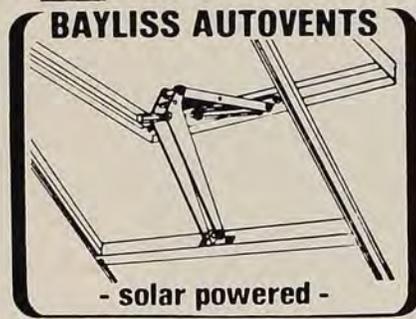
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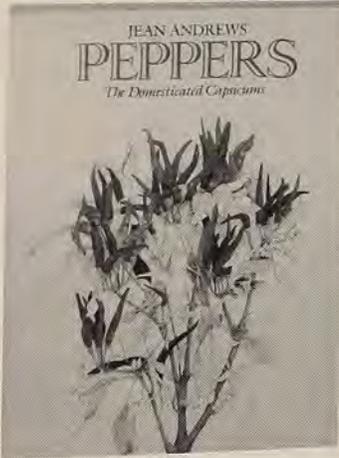
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