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News Edition

# Some Cures for the Winter Blahs

Some gardeners tell us they look forward to winter. They view it as a time of well-earned rest and claim to see an austere beauty in their fallow beds.

But others find themselves more restive than rested. They've been forced into retirement. They pace the floor and heave great sighs and occasionally fondle their pruners. They need something more to do than thumb through the seed catalogs and dream of next season's daylilies.

Perhaps you're in the latter category but have limited your indoor gardening to a couple of African violets and a *Sansevieria* tucked into a corner. Not enough sun, you say. Or perhaps you tend to give container plants the Titanic treatment, overwatering them until you can almost hear them singing "Nearer My God to Thee."

Why not make this the year you go after that gardener's dream—a greenhouse? You can make it small and inexpensive and use it to start seeds from our Seed Program. You can bump out a window and invest in orchids. Or you can blow the budget and buy your own Crystal Palace.

If you grow the most beautiful roses in the neighborhood but engage in wholesale slaughter of house plants, consider hydroponics. Those who've gone the soilless route swear they get lusher plants with less work and less mess, and that you don't need any fancy gizmos to get started.

A terrarium is yet another option. Out of fashion since the 1970s, these environments-in-a-bottle have always had their devotees. Today, heightened sensitivity to the interconnectedness of living things great and small make them a perfect and low-care way to bring a bit of rain forest or desert into your living room.

ROBERTA PROULX

## In This Issue



1993 AHS Seed Catalog Enclosed!

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# Greenhouse Daydreams

You've been thinking about setting up a hobby greenhouse but you're not sure how painful an ordeal this would be. You may be wondering, for starters, how much a greenhouse would cost. Well, take comfort: there are some very cheap greenhouses out there. Greenhouses, in fact, can cost just about any amount, from $69.95 for a portable greenhouse "tent" to whatever the bank will give you as a second mortgage if you plan to imitate the Palm House at Kew. Of course, initial expense is never more than a fraction of the burden every serious hobbyist must bear. Unless you are willing to content yourself with some humble, impermanent, yurtlike structure, there will be a slew of other obstacles to overcome. Use the following steps to orient yourself—and to test your resolve.

Step 1: Find the equator. Whether any part of your property faces it and how far away you are from it—these are matters critical to every aspect of your plan. The usual strategy is to build the greenhouse so that one of its long sides faces at least roughly south. This southern exposure should not be shaded. Though a little shade may be useful in summer, even bare-limbed deciduous trees can cut winter sunlight by 50 percent, according to the Hobby Greenhouse Association. And in much of the country, you are going to have to pay for that loss of light in your fuel bill.

If you live in the North, you should be thinking about your fuel bill at least as much as you think about your plants. Suppose you build a 100- to 150-square-foot greenhouse, which is not really all that extravagant. According to one recent estimate, your winter heating expenses could run up to $400 if you use fuel oil or gas, and up to $700 if you use electricity. Heating is likely to be a major operating expense through USDA Zone 7.

If you have little southern exposure, you need not abandon your hopes, but you should be aware that as you turn away from due south, your choice of plants tends to go down and your fuel bills tend to go up.

Step 2: Consider making the greenhouse part of your house. There is a genre of greenhouse called a "lean-to" that is attached directly to another structure, normally the owner's house. Lean-tos are generally cheaper to build. Hooking up utilities—water, electricity, gas—is also usually easier and cheaper. And the common wall reduces a lean-to's exterior surface area, making it much cheaper to heat.

The principal disadvantage of a lean-to is that it probably won't get as much light as a freestanding greenhouse. Lean-to designs can also be somewhat cramped—the result of accommodating the houses appended to them. And of course you need to consider the lean-to's effect on the house. If your lean-to is going to be home to an Indonesian fungus collection, or something else that demands high humidity and temperatures, ask an imaginative contractor what this might mean for the wall.

There is also a sort of hybrid between lean-to and freestanding greenhouse that you may want to consider. This involves the attachment of a freestanding design, by one of its ends, to the house. The idea is to preserve to some degree the advantages conferred by the common wall, while permitting more room and light than lean-tos usually afford. This approach would work best for a west or east wall, since the greenhouse would then have one of its long sides facing south.

Some people are enchanted by lean-tos. In the lean-to, as they see it, home and greenhouse merge and the delights of the two realms intermingle. If you are moved by such a vision, remind yourself that a lean-to greenhouse is still a greenhouse, and not a solarium. Its climate is meant to suit plants, not to mimic conditions in the family room. Most gardeners will have no trouble understanding this distinction, but if you are uncertain about it, ask yourself this question: Do I expect to watch TV while puttering with my Polystachyae? If the answer is yes, you need a solarium, not a lean-to.

Step 3: Consider going full solar. Strictly speaking, of course, all greenhouses are solar to some degree, at least on clear days. But the term normally refers to those that are designed to capture sunlight and store it as heat, to keep things warm after sundown. Solar greenhouses can look sort of

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odd. They may be half-buried in hillsides to limit their northern exposure. They may have their north walls lined with Chlorox bottles spray-painted black, to hold water for the sun to heat. They may have tarpaulins that are pulled over them at night. Even if your vision tends more towards a crystal pavilion, solar principles are still worth your attention, and there may be ways to incorporate them into your design.

Step 4: Think big. You, or someone else in your family, will inevitably find uses for the greenhouse that you haven't yet imagined and you will need the extra space to accommodate those newfound interests. A bigger greenhouse also means a higher ratio of volume-to-surface area. The bigger your greenhouse gets, the more "inertia" the climate inside will have in its struggle with the climate outside, the easier it will be to maintain a constant temperature and humidity, and the more you will get for your heating dollar.

Step 5: Get a lawyer—or find out for yourself whether your project will run afoul of any local ordinances. Will you need a building permit, for example? Are there zoning laws that affect what you can build on your lot? How does your municipality regulate the extension of utilities to new structures? If you are thinking about heating with gas or oil, check for local regulations on what type of combustion heater you may use. You should also ask your insurer how the greenhouse will affect your homeowner's policy.

Step 6: Try to remember why you wanted to do this. Before actually choosing the materials from which your greenhouse will take form, you should be clear about what you intend to grow in it. Of course, lots of greenhouses are used for several purposes, and there's no reason why you shouldn't use yours to harvest cantaloupes in February, start seeds in March, and maintain a cactus collection year round. But if you have more particular interests, this is the time to take them into account. A specialty need not determine the design, but it can affect your choice of materials and equipment. If, for example, your main interest is bromeliads, you will probably want to chose a glazing material that insulates well. If you grow mainly alpines or bonsai, you may be able to omit this extra expense.

Fortified with your knowledge of law, architecture, and the geography of your lot, you are ready to contemplate the labor of construction. To make the results of your effort as predictable as possible, you will probably want to choose a model from the multitude of greenhouse "kits" on the market. If you aren't handy, or if the term "kit" doesn't quite do justice to the model you favor, you can always hire a contractor to put the thing together. But even if your role in the process will be limited to watching (and paying), you still need to know something about the greenhouse's components, in order to pick the right kit.

WALTER BULL

Walter and Fran Bull, members of the American Horticultural Society's President's Council, designed their own greenhouse using patio doors. This held the cost down and resulted in an attractive structure that could easily be ventilated. The floor is of pea gravel, and the footing is made of cinder blocks capped with treated lumber. A narrow section of plywood separates each door; the roof is corrugated plastic. The greenhouse is heated with eight-inch square ceramic cubes attached to a thermostat. But heating is rarely a problem where the Bulls live, in Columbia, South Carolina. The greenhouse stays warm even on a clear, sunny 10-degree day. Cooling, however, *is* a problem. All plants are moved outdoors in summer. The doors are opened to allow breezes in spring and fall. This often isn't sufficient, and the Bulls make frequent use of a vent cooler made for greenhouses. "We didn't build this ourselves, but it should be easy for anyone who's moderately handy," Fran Bull said. Drainage can often be a problem in greenhouses, but because this one was built on a slope, one drain pipe does the job. "The one thing people would want to make sure of is that the footing is firm, or the doors won't close," Bull said. Because the greenhouse was built at the same time as their home, they did not calculate its cost separately. A lumber store in the Washington, D.C., area sells moderately priced storm doors for $200 to $300 each. The cost of enough corrugated plastic for the roof was estimated at slightly over $100.

The least noticeable component, but arguably the most important, is the foundation. All greenhouses, except for those very simple, nomadic varieties, need one. But even if your model is sold as a do-it-yourself project, caveat constructor: unless you already know how to pour concrete and lay level block, do not attempt to install the foundation yourself.

After the foundation comes the frame. Greenhouse frames are made of either wood or aluminum *Continued on page 4*

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# Greenhouse *Continued from page 3*

(except for "hoop" greenhouses, which are normally framed in polyvinyl chloride or steel tubing). Because greenhouse interiors are so humid, wooden frames must be made of lumber that is very resistant to decay. Today the choice is usually redwood—it should be clear (no knots) heart (from the center of the tree) redwood. Cedar, the former favorite, is still sometimes offered but is now generally too expensive to use. You may also find frames in "pressurized wood," which means that chromated copper arsenate, or some other preservative, has been forced into the grain. (That's right: it's an arsenic compound. Don't throw the scraps in your woodstove.) Some kits don't have frames, but only plans for them. You are supposed to build the frame yourself, usually with pressurized lumber. Despite some builders's claims to the contrary, both redwood and pressurized wood should treated with a suitable preservative or water-repellent stain. And every few years, a new coat will be needed.

Aluminum, on the other hand, doesn't need any maintenance, but aluminum is a much poorer insulator than wood. Because of this, many aluminum frames are constructed with a "thermal barrier"—a layer of insulation sandwiched between the inside and the outside of the frame. The thermal barrier adds greatly to the cost, but unless you live in the deep South it's probably worth the extra expense.

Since it's the reason for everything else, the glazing is understandably the most complicated component. Greenhouse glass can be tempered, to make it more durable, or tinted, to alter the quality of the light. It can be double- or triple-paned, to increase its insulation. Glazing need not even be glass, and if you live where hail, heavy ice, high winds, or vandals are a problem, it probably shouldn't be. Instead, you should consider a synthetic glazing, like fiberglass or polycarbonate, since these materials do not readily shatter. But synthetic glazes usually are not as scratch-resistant as glass and since most are damaged by ultraviolet light, they may not last as long. The synthetics also come in various forms, including multiple-pane, and their cost is generally competitive with glass. Your choice of glazing should be governed by two considerations: would you be better off with glass or a synthetic, and how much insulation should your glazing have?

Life inside the greenhouse is regulated by a collection of gadgets of varying complexity and cost. There are heaters, ventilation fans, thermostats, temperature alarms, shades, misting systems, and so on. You will not need to own all of these things to use your greenhouse. Initially, you need only assure yourself that the heater you intend to use is compatible with the greenhouse design and that you will have adequate ventilation. The best way to match the heater to the greenhouse is to buy one that is designed specifically for it. Many kit manufacturers sell heaters too, although these are usually offered separately, as "accessories." Ventilation is especially important if you intend to use the greenhouse in summer, and if you live in the South. Make sure your design includes both lower and upper vents, so that the interior can be cooled by convection. It should also be possible to fit the upper vents with fans, should greater airflow prove necessary.

If your enthusiasm has survived this discussion, the greenhouse of your dreams may yet find a place in your yard. ✦

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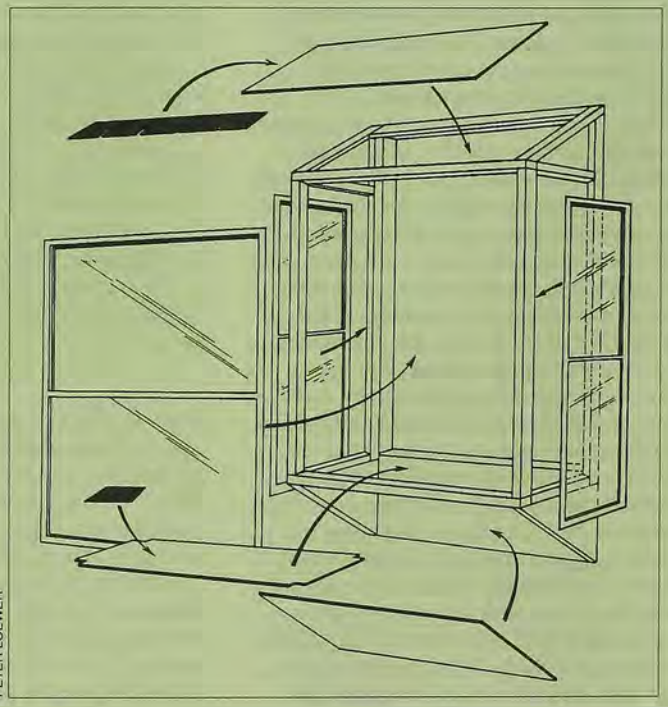
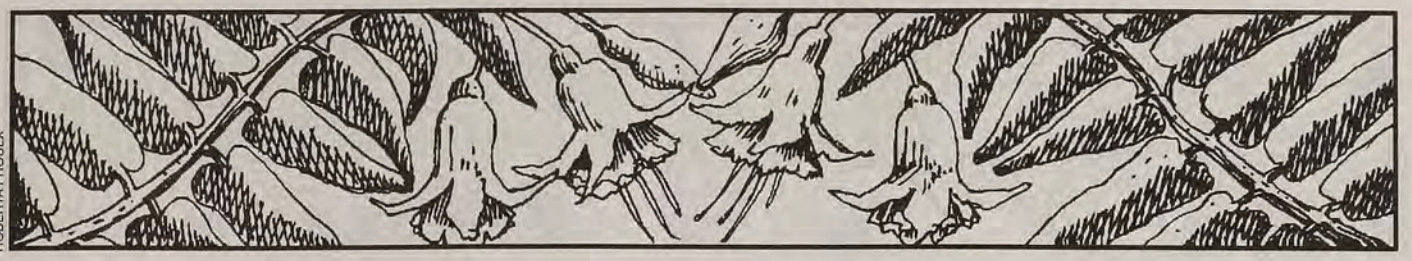
*The Hobby Greenhouse Association publishes a "Directory of Manufacturers," from which you can order catalogs of greenhouse makers. Write Hobby Greenhouse Association, 8 Glen Terrace, Bedford, MA 01730-2048.*

Author and illustrator Peter Loewer has increased his indoor growing space by making a greenhouse window from four white aluminum storm windows. In his 1990 *The Indoor Window Garden,* he writes: "It was designed to fit an opening in the outer wall of the front room that originally held a large wooden window with two frames of the old-fashioned type that used clothesline and lead weights. . . . The roof on the new greenhouse was shingled instead of using glass, since the winter sun is so low in the sky we knew we could do without the extra light."

The framing is made of standard two-by-fours. The bottom, flooring, and roof are made of exterior grade (marine), AA plywood. The floor was covered with black vinyl slate, and two sheets of acrylic in wooden frames were hinged to the inside of the frame, allowing the greenhouse to be closed to the room. The installation of an outlet under the window allows it to be warmed with a small heater in winter; the screens that came with the storm windows provide ventilation in summer and help reduce summer sun on sensitive plants.



PETER LOEWER



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# Hydroponics Made Enticingly Easy

Most gardeners have at least heard of hydroponics or hydroculture—soilless gardening said to make indoor plant growing a snap.

But books on the subject, and many magazine articles, tend to be terrifying in their technological bent, showing photographs of tubes and trays and lights and pumps and gauges, and giving recipes for complicated nutrient formulas. For those who view gardening as a way of getting in touch with nature, this seems a giant step backwards.

But in fact, anyone who has ever stuck a wandering-Jew stem in a glass of water or helped a child start a sweet potato vine is gardening hydroponically. With the addition of a water gauge and some ready-made nutrient, say more laid-back hydroculture fans, the home gardener can grow any house plant with less guesswork about watering and less mess from potting soil. They contend that plants grown in hydroculture are lusher yet take up less room than their soil-grown counterparts, need repotting less frequently, are less prone to soil-borne diseases and insects, and of course, they never need weeding. Plants are also less likely to suffer from lack of humidity.

Melitta Collier, a resident of Silver Spring, Maryland, began gardening hydroponically 20 years ago and now lectures and writes frequently on the topic. Her plants include ferns, orchids, cape jasmine, a ceiling-high palm, and even a cactus. Asked about various pieces of advice proferred by other experts, her response is usually, "I don't do that. Gardening is supposed to be fun." This is what we always thought, too.

You don't need special pots, she says. They should be water-tight and can't be porous, but she converts ordinary plastic pots by plugging the drainage holes with florists' clay.

If beginners are growing plants that don't need any type of support to stay upright, they can start with just a mix of water and nutrient solution. Otherwise they will need an inert medium to keep plants from flopping over. A popular one is expanded clay pellets, which Collier describes as looking like "Kibbles 'n' Bits" dog food. Some gardeners use sand or stone. But unless you want to mess around with pumps to aerate your roots, Collier urges the use of a medium with capillary, or wicking, action. These include charcoal (which will also help deter algae); expanded slate, or haydite; scoria, a crusty lava; or horticultural rock wool.

COURTESY OF MELITTA COLLIER

*Melitta Collier's sun room, where most plants are grown without soil.*

Next you'll want plants. Plants developed for hydroponic growing are widely available in Europe, where public buildings, from malls to restaurants to hospitals, are landscaped hydroponically. Some books advise against trying to convert soil-grown plants to a hydroponic system. Collier says, in effect, nonsense. Most any house plant can prove amenable. Chinese evergreen or dieffenbachia would be good for beginners. You do want to make sure that the roots are scrupulously clean. "I probably have the most difficulty with fine roots, like the ones on ferns. I cut off most of the root ball, and wash them off well under the faucet." She also avoids transferring from soil any plant with a large, thick root, like her cape jasmine. From it, she took cuttings and rooted them; a hydroponic container is an excellent way to start cuttings. A retired fish tank works well for this, even if it's cracked, if you put a sheet of glass or plastic over its top. African violets can be cut off at the soil line and a new root system, better adapted to a hydroponic culture, developed by anchoring it in barely moist perlite.

Your plant should be sunk into its medium with its crown just above the highest water level, which should be a maximum of one-third your container depth. Some growers use a system that will allow periodic flushing out of the plant and its medium: a double pot arrangement, or a plastic mesh bag that can be plucked out of its container.

In regard to lighting, you will have to know something about the specific requirements of the plants you're growing. While tomatoes and other edibles require artificial lighting, Collier, who has a sun room, says tropicals should thrive in the natural light of windows and skylights. Herbs can also be grown in a sunny window.

Probably the most intimidating aspect of hydroponic advice relates to the nutrients they require because the medium that anchors them is inert. One book presents five recipes for mixing chemicals, and invites the reader to choose among them. This is especially off-putting to those who don't want to use any chemicals on plants, and don't know much garden chemistry beyond the fact that a compost requires some green stuff and some brown stuff.

Dr. Stuan K. Sutherland, an Australian animal toxicologist, was the only author we came across whose book made hydroponics look like a jolly good time. In his 1986 *Hydroponics for Everyone,* he says: "Personally, I cannot think of anything less likely to enthuse one's household towards hydroponics than filling the kitchen or laundry up with bags and bottles of chemicals."

In this regard as well, Collier is as reassuring as a good midwife. She likes to use slow-release granules formulated for hydroponic gardening, sprinkling them on the clay pellets about every three to five months.

"You can also use any evenly balanced plant food, but you'll need to dilute it until the concentration is more like 2/2/2," she says. Other growers say this is risky, because in hydroculture, there is no soil to buffer extreme *Continued on page 6*

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## Hydroponics *Continued from page 5*

pH levels, mineral salts, or to provide micronutrients, which are contained in hydroponic formulas. There's no guesswork involved with the liquid hydroponic nutrients; most growers add them with each watering. A plant is rewatered when the water level drops almost to zero; that's what your water level indicator is for.

Joelle Steele, a consultant to interior landscapers who writes frequently about hydroponics, suggests that chlorinated water should be left to stand for two days before it is used in a hydroponic system. The chlorine can affect the pH of the water, which should be kept between 6 and 7, she advises. Other authors issue warnings about water with a high content of salt and other minerals, suggesting the use of rainwater or periodic leaching.

"I guess I'm lucky," says Collier. "Our water is mineral-free and the granules I use contain resins that collect salts. In the summer the plants get leached by rain. I drill or burn holes in the containers, set them outside, then plug the holes up again with florists' clay in the fall. I do watch for a hazy residue, and I leach my plants periodically. But I'm not a mad chemist." ✦

*If you want to learn more, you may want to contact the Hydroponic Society of America, Box 6065, Concord, CA 94524, (415) 682-4193.*

# The Enigmatic Terrarium

In 1827, a London physician named Nathaniel Bagshaw Ward peered into a covered glass jar in his study and made a discovery that proved critical to the science of botany. Growing in some mold on the bottom, Ward found a tiny fern and a single blade of grass. Ward liked to put caterpillars in bottles, where he could watch them pupate and emerge as butterflies. One of his captives had died, and the two tiny plants had emerged from its remains. Ward saw the implications instantly: The plants were growing in a closed and (more or less) self-perpetuating system.

Thus was born the Wardian case, a close-lidded, glass and wood box for keeping plants. Ward's simple invention opened a new era in botanical exploration. Collecting had previously been hindered by the lack of a reliable means of transporting specimens from their exotic provenances to European conservatories. But no longer: Packed into one of Ward's cases, a plant could survive months at sea and emerge green and healthy at the London docks.

The Wardian case had major ornamental potential as well. Usually planted with ferns, it found wide favor with both wealthy and middle class gardeners, who made the "fern case" a standard part of 19th century decor. The popularity of these early terrariums even won them a place at the celebrated International Exhibition of 1851, in the Crystal Palace.

Terrariums have not changed in their essentials since Ward entombed that hapless caterpillar. They consist of a glass or plastic container that is usually closed but may be open if the plants to be grown cannot tolerate high humidity. Light may be supplied artificially or through a nearby window. Growing media must be sterile and not too rich, but can be quite varied in other respects. A mixture of commercial potting soil, sand, and sphagnum will work; so will a soilless blend of peat moss, perlite, and vermiculite. Good drainage is important, so a substrate of charcoal or pebbles may also be included.

Those are the basics, but the basics don't explain the terrarium's appeal. The most recent terrarium fad occurred in the mid 1970s. Most terrarium books were published at that time: They contain pictures of people in floral polyester shirts showing how to grow ferns under glass coffee tables. A small number of devotees kept faith and now the terrarium is once again attracting adherents.

Some find that the terrarium's appeal lies in the container and give the plants secondary billing. They fashion mini-terrariums in little perfume bottles and build "plant columns" in bell jars. They collect five-gallon carboys, oversized brandy snifters, fish bowls, jumbo Mateus bottles, and kerosene lanterns. All of these containers have what decorators would call "possibility," and if you like this sort of thing, you may begin seeing possibilities everywhere. Is that ancient television console still out in the garage? Remove the picture tube and install a bog garden.

Another approach is to choose the plants first, then build the terrarium around them. Terrarium flora varies greatly, though the most successful plants tend to be dense, slow-growing, and small. Common arrangements include succulents and cacti, ferns and mosses, or begonias or gesneriads. Here too, you can be much more adventurous, especially if you're thinking in terms of a "theme terrarium." You could make Bug Hell with a collection of carnivorous plants or an underwater garden with a fishless aquarium.

Landscapes are another productive approach. For these you may need trees, and some people use real ones: seedlings of dwarf Natal plums, for example, or of coffee trees or dwarf pomegranates. Terrarium pomegranates have even been coaxed into bearing fruit. Many people like their landscapes with props. Oriental vistas may include little pagodas and gates. Shells, corals, and driftwood cover a great deal of terrarium terrain. One writer encourages hobbyists to cultivate "a unique feeling of reality" by dropping in the skulls of birds and small rodents.

But what, after all, is the appeal of a caseful of plants? Perhaps it's that people still find the terrarium "curious to watch in operation," as one 19th century manual puts it. "To many it is evidently as much of an enigma as a pleasure."

*For the latest on terrarium theory and practice contact the Terrarium Association at P.O. Box 276, Newfane, VT 05345.*

# Making a Difference

## The Generous Men of Maryland

Highways, public gardens, and schools in the Washington, D.C., area are getting an extra lift from the Men's Garden Club of Montgomery County (Maryland). The group is using profits from sales of its book, *Successful Gardening in the Greater Washington Area,* to fund 10 gardening programs in Maryland, Virginia, and Washington, D.C. The grants, totaling $15,000, were awarded to:

✦ **Brookside Gardens,** Wheaton, Maryland. $4,500 for the gardens' botanical internship program, in which upper-level undergraduates and graduates work in rotation in areas throughout the gardens. Operated by the Maryland-National Capital Park and Planning Commission, Brookside Gardens is a 50-acre public garden featuring collections of azaleas and rhododendrons, conservatory floral displays, and other permanent and seasonal plant displays.

✦ **U.S. National Arboretum,** Washington, D.C. $4,000 for a stone wall to protect the deteriorating azalea plantings in the Mount Hamilton area of the arboretum. The 41-foot-long, V-shaped wall will be built opposite the Frederic P. Lee Memorial and will stem erosion on one of the steepest slopes. Lee, an attorney, was chairman of the arboretum's Advisory Council and a former First Vice President of the American Horticultural Society.

✦ **Maryland Department of Transportation.** $1,500 to support privately financed wildflower plantings along Maryland's highways. The transportation department has designated 45 acres for wildflower plantings at scattered sites along the highways. Among these sites are gateways into Maryland from Pennsylvania, Delaware, and West Virginia.

✦ **Meadowlark Gardens,** Fairfax County, Virginia. $1,000 to develop a children's butterfly garden. Meadowlark Gardens is operated by the Virginia Regional Park Authority.

✦ **Montgomery County Public Schools.** Up to $1,000 for teaching aids for schools with special horticultural programs.

✦ **Maryland 4-H Foundation.** $1,000 to update the foundation's library and teaching materials.

✦ **Walter Johnson High School,** Bethesda, Maryland. Up to $500 to purchase trees for the school grounds. High school students will participate in the tree plantings.

✦ **National Capital Area Council of Boy Scouts of America.** Up to $500 for the materials needed to help Eagle Scouts earn merit badges that relate to horticultural projects for community improvements.

✦ **Strathmore Hall Arts Center,** Bethesda, Maryland. $500 to support the center's tree replacement fund.

✦ **Historic Medley District,** Poolesville, Maryland. $500 for garden improvements in the district's garden of pre-1850 native Maryland plants. The garden was developed by the late Edward L. Stock, a Washington, D.C., area nurseryman and one of the founders of the Men's Garden Club.

This is the second year for the grant program. Last year the garden club donated $21,000 to seven organizations. The Men's Garden Club of Montgomery County was founded in 1946.

## Fenny Pennies

"Pennies From Heaven"—or more accurately, "Pennies From the Deer Creek Elementary School"—might be the new theme song of the Nature Conservancy's Colorado Field Office. The students of the elementary school, which is near Bailey, Colorado, recently donated one million pennies to the conservancy's High Creek Fen project. "The penny drive began as a way to teach students just how much a million really *is,*" says teacher Lynne Tweedy.

But students and teachers also wanted the pennies to go to a good cause. Students surveyed local residents, then decided the money would be donated to the High Creek Fen project. The Nature Conservancy is restoring the high-elevation peatland, which is thought to provide homes to more rare plant species than any other Colorado wetland.

During the school year students did odd jobs and held book fairs, walk-a-thons, read-a-thons, and rocking chair-a-thons, asking to be paid in pennies. Some donors, apparently eager to unload their stocks, donated pennies outright. When the pennies neared the one million mark, students spread them one deep over the school's gym floor and most of the cafeteria.

Last June the students presented the Nature Conservancy's Colorado Field Office with their $10,000 donation—but they graciously paid with a check.

## Trees on the Run

Of the dozen trees Tim Womick planted in Homestead, Florida, last year, Hurricane Andrew only left two standing. So Womick, who has been running through the states planting trees and talking to school children about the environment as part of his Trail of Trees program (see "The Man Who Runs for Trees," *American Horticulturist,* March 1992), will return to Dade County for a 100-mile run this month. The 34-year-old amateur runner will begin his trek in Sweetwater, a suburb of Miami, and run from school to school until he reaches Homestead. Along the way he will plant seedlings and distribute about 20,000 trees for school children to plant.

Womick will continue his Trail of Trees program in Georgia in February and has announced plans for a transcontinental run on the newly designated American Discovery Trail beginning this spring. That run will begin in Los Angeles, with a kickoff given by the environmental group Treepeople, and end on Arbor Day 1994 in Washington, D.C. From Los Angeles Womick will run north to Point Reyes National Seashore, the beginning of the Discovery Trail. The multi-use trail is one of the few east-west trails in the United States. It connects several north-south, local, and regional trails and winds through 13 states to end at Cape Pendleton State Park in Delaware. Womick will stop at schools and local gathering places throughout each state.

Trail of Trees is sponsored by the Global ReLeaf program of the American Forestry Association, Famous and Historic Trees, the U.S. Forest Service, PowerBar athletic energy food, and Saucony running shoes.

*For more information about the Trail of Trees program or to make a donation write: Tim Womick, Trail of Trees, P.O. Box 553, Cashiers, NC 28717.*

# Regional Notes


COURTESY OF MCCAREN DESIGNS, INC.

*A restaurant sits in a "clearing" in Knott's Camp Snoopy, the seven-acre park inside the Mall of America.*

## Predators at a Minnesota Mall

On your next trip to the shopping mall, you may want to take a field guide along—at least if you're heading for the immense Mall of America in Bloomington, Minnesota, just south of the twin cities. Inside the 327-store mall is a seven-acre park, believed to be the single largest interior landscape in the world. And its nearly 40,000 plants are beginning to attract more than just shoppers. The park is known as "Knott's Camp Snoopy," after the dog in the "Peanuts" cartoon and Knott's Berry Farm, the company that maintains the grounds.

Camp Snoopy, which opened last August, is intended to recall the Minnesota landscape. But its plantings consist mainly of non-native species, since the region's own flora generally does not do well indoors, according to Cindy Peterson, a vice president at McCaren Designs, the landscaping firm that designed and installed the park. Instead of natives, McCaren filled the park with a wide assortment of exotics. Among the more than 80 varieties of small plants are Natal plums, orange jasmines, and New Zealand laurels. The 14 varieties of trees include figs, fern pines, and olives. The red maple is the only native tree represented. (Charlie Brown's Kite-Eating Tree is a *Ficus nitida*.)

Regardless of its origin, this much vegetation is bound to attract more than shoppers. Several months after the mall's opening, aphids had reached noticeable levels, a population of leafhoppers had turned up, and spider mites and mealy bugs are expected any day.

But that's all part of the plan. The park, which won McCaren an Associated Landscape Contractors of America "Environmental Improvement" award, is supposed to control its own pests. With the help of scientists at the University of Minnesota, McCaren has been monitoring pest populations and this spring, predatory insects will be introduced. By resorting to biological pest controls, McCaren expects to greatly reduce the need for conventional pesticides.

Among the candidates for introduction are various species of ladybugs, nonstinging wasps, and mites. People need not fear these terminator bugs. All are very particular in their tastes, and since they are generally smaller than their prey, shoppers probably won't even notice the war going on around them.

The use of biocontrols in interiorscapes is not original with McCaren. Midway Mall in Sherman, Texas, has employed parasitic wasps to control mealybugs on *Ficus* plants (see "Wasps Shop Till Mealybugs Drop," *American Horticulturist,* May 1991). But McCaren's program will bring the technique inside on an unprecedented scale. In some ways, Peterson says, scaling up biocontrol makes it easier: so vast a wilderness (from a bug's point of view) should make for more stable predator populations.

But it's not simply size that distinguishes this program from its predecessors. McCaren has gone a step further, by building biocontrol parameters directly into the landscape design. "During the project's design phase," Peterson explains, "we made sure that the plant varieties, humidity levels, and light levels would be suitable for predators." Such planning will allow for a broad range of biocontrols, though of course each predator-prey interaction will still have to be carefully monitored. (Is the *Continued on page 9*

## A Georgia Garden Threatened by Concrete

When the Georgia Department of Transportation notified Olin and Louise Holsomback that some of their property was to be appropriated for a new highway, "they claimed," Olin Holsomback says, "that everything was negotiable." Three years later, the Holsombacks are facing what amounts to an eviction notice and the destruction of a garden 50 years in the making.

The Holsombacks's five acre-plus lot borders the Chickamauga Battlefield National Park in northwest Georgia. The new road would bypass the park but would consume about an acre of the Holsomback property, including the couple's house and their valuable collection of rhododendrons and azaleas.

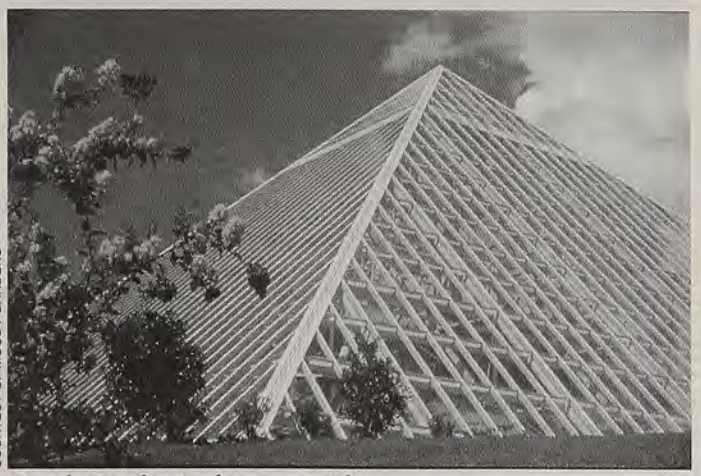
"We had kind of reconciled ourselves to the fact that they were going to take the house and part of the property," says Holsomback. So the couple began planning a new house and started moving their most valuable plants to other parts of their lot. But officials then announced that engineering requirements prevented them from allowing the Holsombacks to build another driveway—either to the new highway, or to the only other road in the vicinity. Without access to the property, both garden and gardeners will have to be uprooted.

The Holsomback garden contains Japanese, Chinese, and Korean rhododendrons, both species and hybrids. There is also a large collection of azaleas, which Holsomback considers a significant gene pool for that group of plants—an opinion shared by Fred Galle, a retired horticulturist for Callaway Gardens in Pine Mountain, Georgia, and the author of a book on azaleas. But the collection's biological value has not impressed the department of transportation.

When he asks officials to justify their choice of a route, Holsomback says, "they've given me all sorts of explanations." The couple suspect that other routes could have been chosen. But for now they and their plants remain adrift in a bureaucratic limbo, unsure if they should continue transplanting—or if they themselves are going to be transplanted.

Some larger gardens have taken an interest in the couple's plight, but only to invite them to donate their plants—a form of aid they have thus far refused. After all, says Holsomback, "the garden is more than the plants and you want to save the whole thing."

# Rain Forest Under Glass


COURTESY OF MOODY GARDENS

*Moody Gardens's glass pyramid.*

While the travel industry has wholeheartedly embraced the idea of ecotourism, Moody Gardens in Galveston, Texas, is reversing the process by bringing the rain forest home. On March 27, 1993, Moody Gardens will open its Rainforest Pyramid, a 10-story glass and tubular steel edifice housing a 40,000-square-foot rain forest ecosystem. The permanent exhibit assembles a collection of more than 2,000 plants indigenous to three continents.

Moody Gardens, a 142-acre recreational and educational complex and nonprofit organization located on Galveston Island, is home to the Hope Therapy Program. Founded in 1982, the program provides animal and horticultural therapy and educational and employment opportunities to people with physical and emotional disabilities.

Although fundraising for Hope Therapy is the *raison d'etre* of Moody Gardens, the immediate goal of the exhibit is to vivify for sightseers one of the earth's most endangered and potentially most valuable natural environments, the tropical rain forest. Gary Outenreath, horticulture exhibit manager for Moody Gardens, says, "Our goal is to create as much visual excitement as we can through foliage, textures, and colors to demonstrate the beauty, biodiversity, and fragility of the rain forest environment."

To assemble these rain forest flora, members of the garden staff collected specimens from Costa Rica, Ecuador, Mexico, Panama, the Philippines, Peru, Puerto Rico, and Hawaii. Most plants were chosen for their exotic beauty or usefulness: flowering trees such as pink trumpet tree, cassias, poincianas, jacaranda, and markhamia; vines such as tropical bleeding-heart, Dutchman's-pipe, cup-of-gold, and velvet ivy; and food plants such as vanilla, macadamia, papaya, banana, and coconut.

The exhibit recreates the rain forest ecosystems of Asia, Africa, and South America. In the South American environment, a path takes visitors past an Indian ruin festooned with clinging lianas, through ficus trees and philodendrons, and into a canyon ablaze with colorful orchids, bromeliads, and other epiphytes. Dominated by a woody bamboo forest, the mock Asia environment features pine trees, rhododendrons, and a network of ponds bordered by mosses, irises, and lilies. In the African section, soaring palms dwarf delicate ferns and wildflowers, and waterfalls cascade over terraced rock formations.

Says Director of Gardens John Kriegel: "It is our hope that our Rainforest Pyramid will help educate our visitors about the importance of conserving our natural resources. So much is still unknown about the rain forests; but we do know the global community of ecology does impact us all."

# Predators *Continued from page 8*

two-spotted spider mite hiding from the predatory mite *Phytoselulus persimilis* on hairy-leaved plants? Then perhaps it's time to unleash another attack mite, *Typhlodromus occidentalis*.) This kind of effort doesn't come cheap: Peterson estimates that her bugs will cost $3 for each square yard of plantings for the first year or so, well above the cost of conventional control. But once the predators are established, expenses should drop.

Essential to the program's success, says Peterson, is the idea that "the plantings should be healthy but not perfect." Biocontrols will not kill every last pest, so somewhere in the plantings, something will always be chewing a leaf or gnawing a stem. After all, if the predators are too successful, they will run out of food and starve. This natural "imperfection" is a major departure from the homogenized sterility typical of mall interiors, and that helps to explain Peterson's hopes for the park. "We're hoping," she says, "that the park itself gets to be a destination—that people will start coming to the mall to see it, and not just to shop." ✦

# East Meets West in the South

New architectural elements are drawing attention to an unusual international plant collection at the Sarah P. Duke Gardens' Asiatic Arboretum in Durham, North Carolina. Juxtaposing Japanese-inspired landscape features with a collection of analogous American and Asian plants and an award-winning American landscape design, the arboretum embraces the best of the East and the West.


COURTESY OF DUKE UNIVERSITY

On October 16, 100 people attended a ceremony to dedicate the arboretum's new pagodalike main entrance gate; other new architectural elements include stone lanterns, an arched bridge, and a small seating shelter akin to those where guests assemble before traditional Japanese tea ceremonies.

The christening of the main entrance gate was especially significant to horticulturist Paul Jones, who has been in charge of the 20-acre arboretum since its creation in 1984. "The gate with the name of the arboretum engraved on the limestone step gives the place its own identity," Jones said.

Although the gardens have graced the Duke University campus for more than 50 years, the arboretum was added only eight years ago, when Duke Gardens Director William Culberson was struck by the similarity of the native flora of eastern North America to that of eastern Asia.

"This is not very well-known, except among botanists, and is not reflected in North American botanical collections. So I sold myself on the idea of developing a collection of woody plants that would underline these relationships." That collection now includes 513 species and cultivars, among them witch hazels, camellias, daylilies, bamboos, hollies, Japanese irises, rhododendrons and azaleas, deciduous magnolias, Japanese apricots, and various ornamental grasses.

At the dedication ceremony, special guest speaker Hisao Kanzaki, a Japanese business executive, remarked on the seeming authenticity of the new accents. "I'm astounded that something like this is being done in this country."

But Culberson cautions that "We are not trying to create the kind of landscape seen in Japanese or Chinese gardens." In fact, the landscape design was original enough to garner a 1990 Award of Merit from the American Society of Landscape Architects for architect Linda Jewell.

# Gardeners' Q&A

**Q:** *How can I improve my family heirloom seed varieties without undertaking a complex breeding program?*
*K. L., Little Rock, Arkansas*

**A:** As your heirloom seedlings and plants are growing, weed out all but the best performers before they flower. This will prevent poor plants from cross-pollinating (if in fact the plant does cross-pollinate) with stronger plants. If plants do not cross-pollinate, you can select outstanding plants and pollinate them by hand. Make sure that after hand-pollinating a flower, it is covered with a bag so no other pollen will get to its stigma.

At the end of the growing season, select what you consider the best plants of whatever variety you want to improve upon. Look for the healthiest and most vigorous specimens. They may be the largest—or the smallest, if you want dwarf or compact plants. Among flowers, they may have the biggest bloom, best fragrance or color. If it is a vegetable or fruit, you should select on the basis of flavor, number of days to maturity, number and size of fruits or vegetables, and insect and disease resistance.

Collect seeds only from the mature fruits of the selected plants and allow them to dry completely. Put the seeds along with a silicone desiccant in airtight containers and store them in a cool, dark area. Make sure that each container is correctly labeled. Do not grow out seed that is more than three years old (especially seed not stored in optimal storage conditions) because such seeds are apt to produce less vigorous and productive plants than those grown from fresher seed. It is also a good idea to keep a record of the cultural practices that led to a superior crop. Your record should include sowing date, soil condition and amendments, cultural care, and weather conditions. By keeping track of what worked best for each heirloom, you can introduce more of those practices each time you grow that specific plant.

**Q:** *I'd like to try propagating ornamental perennials from root cuttings. Can you explain the basics? Which perennials can be propagated in this way?*
*N. P., Montauk, New York*

**A:** Propagation by root cuttings is often used commercially when propagation by other means is too slow or unsuccessful. Like other methods of vegetative propagation, it is useful for increasing stock of cultivars that don't come true from seed or plants that don't produce seed. It is less damaging or disfiguring to the mother stock than propagation by leaf or stem cuttings. But root propagation is usually slower than those methods, taking at least four to seven months before propagated plants can be placed in a permanent growing situation.

Perennials that can be propagated by root cuttings include bear's-breech (*Acanthus*), windflower (*Anemone*), cupid's-dart (*Catananche*), bleeding-heart (*Dicentra*), globe thistle (*Echinops*), storksbill (*Erodium*), sea lavender (*Limonium*), phlox, primrose (*Primula*), and mullein (*Verbascum*).

In January, February, and March, given favorable conditions, roots can draw upon the stored starch from the previous season to begin growing. Dig up the plants you want to propagate. Cut off several roots close to the plant's crown, where they are largest. Do not remove more than one-third of the entire root system. Replant the parent plant.

Carefully lay out the cut roots so that they are oriented from top to bottom, as they were growing on the plant. Cut the root pieces into smaller sections about one-and-a-half inches long. Be careful to keep them right side up. Lay the smaller pieces in neat rows so that they are all correctly oriented.

Fill a growing flat with a sterile propagation mix. Make sure the container has good drainage. Bank up one side of the flat with soil to a 45-degree angle and lay the root pieces on this bank with their tops up. If the container is large, it can be "terraced" to accommodate several rows of cuttings.

Cover the cuttings entirely with the soil mix, with the top of the cuttings near the surface and their bottoms about a half-inch below the soil surface. The top of the root piece will produce new shoots, while the lower half will generate a root system. Cuttings will produce shoots faster and more uniformly if given an air and soil temperature of at least 60 degrees. Keep them moist, but do not overwater. When new shoots appear, you can begin fertilizing the plants with a balanced liquid feed such as 5-5-5. New plants can be carefully transplanted to larger, individual containers when the new root system has sufficiently formed to support the growing shoots.

**Q:** *Some seed packages that I purchase are labeled "certified seed" while others are not. What is meant by the term "certified seed," and does this mean the seed will germinate better?*
*G. B., Pensacola, Florida*

**A:** "Certified seed" conforms to production guidelines for ensuring the genetic purity of a plant variety as determined under the Federal Seed Act (FSA). The FSA is administered by various state agencies. Seed certification programs were formalized under the FSA in 1939 to help ensure the genetic purity of new and old varieties. While certification does ensure that seed so labeled is what it claims to be and should perform as expected of that variety given the proper planting and growing conditions, it does not mean that all the seed is undamaged or that it will have higher germination rates than uncertified seed.

**Q:** *Each year I have a lot of leftover seed. How do I know if the seed is still good to use the next year or the year after that?*
*R. S., Seattle, Washington*

**A:** If you have stored dry seed in an airtight container in a cool, dark place (a refrigerator), your seed from the previous year is most likely fine to use again. Most flower and vegetable seed, if stored under optimal conditions, is viable for three to five years. But I would suggest doing a germination test on the seed, especially if it has been stored for more than one year.

Take about 20 seeds and lay them in the center of a moistened paper towel. Make sure seeds are separated from each other. Carefully roll up the paper towel, twist each end, and place one end in a glass that has several inches of water in it. Place in a warm spot and make sure to label the glass with the seed name and date. Unroll the paper towel in about three days and check for any germinated seed. Seed is considered germinated once a cotyledon has come through the seed exterior. Check every day for up to three weeks. Most garden ornamentals and edibles germinate within this period of time. After three weeks, count the seeds that did germinate. You can figure the percentage of viable seeds for the current season, then calculate how many seeds you will need to plant to obtain the desired number of seedlings.

*—Maureen Heffernan*
*AHS Education Coordinator*

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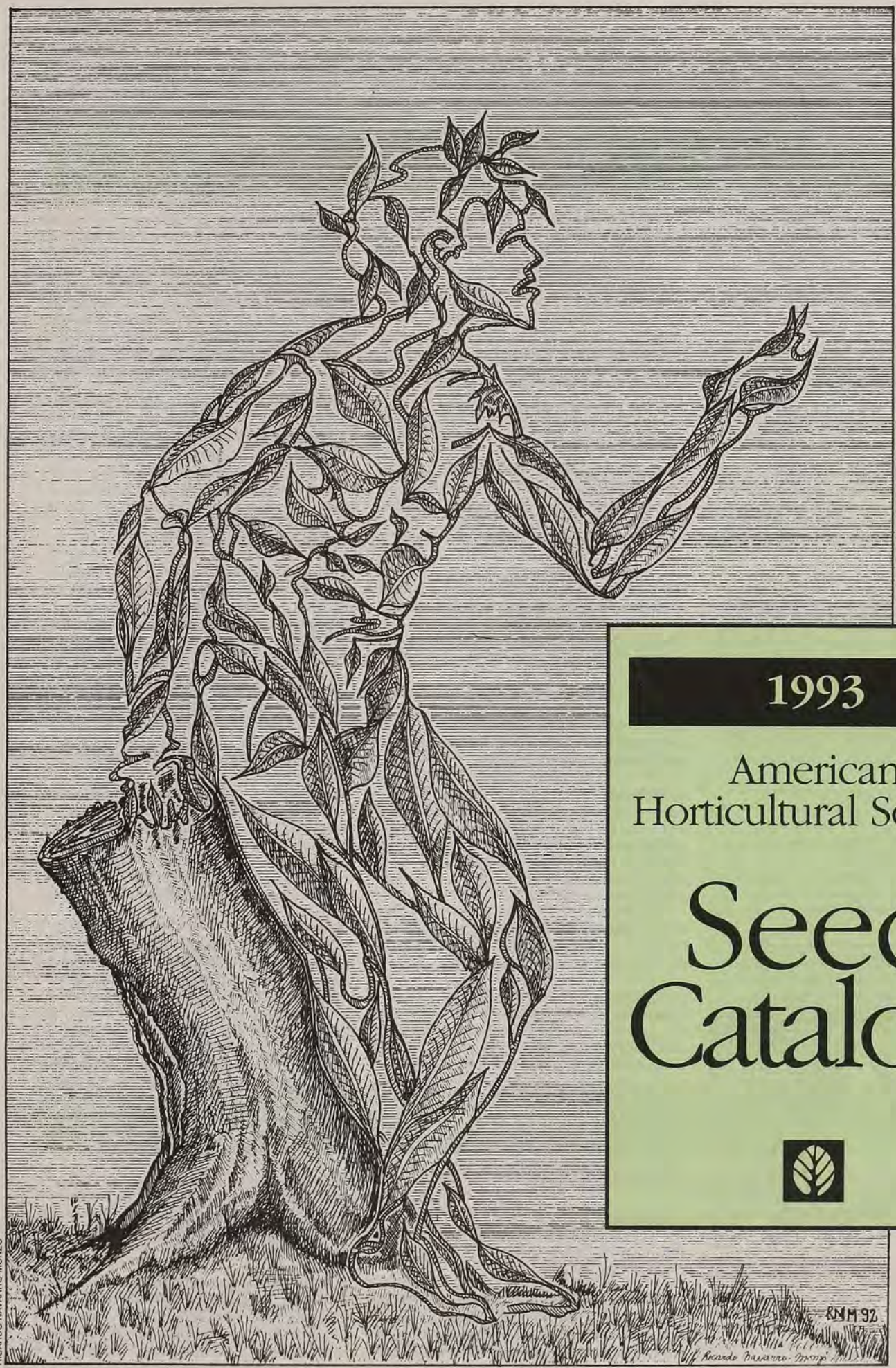
*Call AHS's Gardeners' Information Service with your gardening questions at (800) 777-7931 betweem 11 a.m. to 3 p.m. EST.*




1993

American Horticultural Society

# Seed Catalog

**Unless otherwise stated, it should be assumed that all plants grown from the seed in this catalog do best in full sun and in well-drained soil.**

# Annuals

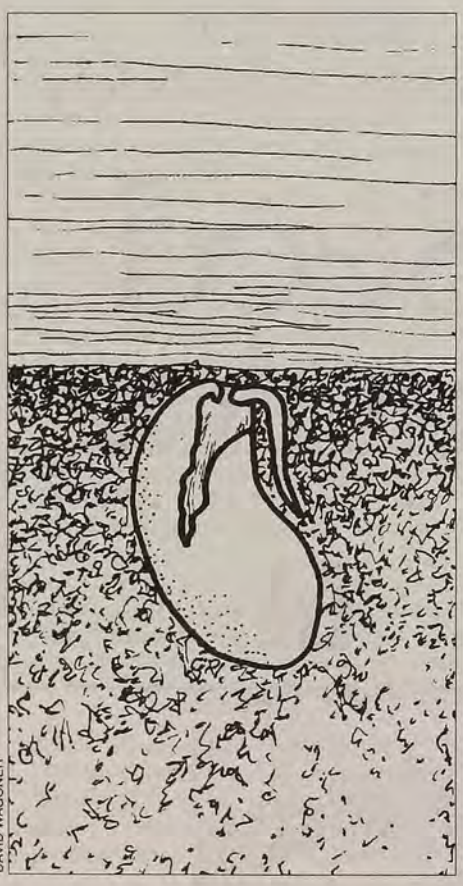
1. *Agrostemma githago* **'Milas'.** Rose-of-heaven cultivar. Height: 2-3 feet. Old-fashioned, lilac rose-colored flowers are cup-shaped and finely striped, borne on erect, slender stems above grassy gray green leaves. Will self-sow each year. Prefers very well-drained soil that is not too fertile. Deadheading spent blooms will encourage flowering all season. B,H.

2. *Amaranthus caudatus.* Love-lies-bleeding, tassel flower. Height: 3-5 feet. Vivid red tassel-like flowers last for weeks. The young leaves and seeds are edible. The seeds should not be covered or sown deep. B,G.

3. *Briza minor.* Little quaking grass. Height: 16 inches. Upright, narrow leaf blades with loosely attached spikelets of flowers. Gives plant a nodding effect, especially in a breeze. Inflorescence is first light green, turning brown at maturity. B,H,K.

4. *Browallia speciosa* **'Blue Bells Improved'.** Browallia cultivar. Height: 10 inches. Violet-blue, star-shaped flowers turn lavender. Vigorous branching makes it excellent as a bedding plant or in hanging baskets. Prefers a warm growing season with plenty of moisture. Full to part sun. A.

5. *Calendula officinalis* **'Pacific Beauty'.** Height: 24-30 inches. Uniformly large day-blooming flowers have flattish orange and yellow rays. Excellent for cutting. Very easy to grow. Blooms spring to frost. Start indoors 8 weeks before frost for spring bloom. A,B,H.



DAVID WAGONER

6. *Cardiospermum halicacabum.* Balloon vine. Height: to 10 feet. Woody-stemmed perennial grown as an annual. Vigorous self-clinging vine. Dense, feathery, light green foliage smothered with petite snow white flowers, then seed pods that look like green balloons a bit smaller than golf balls. In warmer climates plant self-seeds quite freely. A,B,G,H.

7. *Celosia cristata (C. plumosa).* Cockscomb. Very showy annual with bright, feathery, erect plumes. Long-lasting flowers are 4-12 inches long and may be scarlet, off-white, pink, or yellow. A,G.

8. *Ceratotheca triloba.* Zimbabwe foxglove. Height: to 6 feet. Pendent rose lavender flowers to 3 inches, borne on softly hairy, squarish stems. Leaves 6 inches long, varying from ovate to 3-lobed. Native to southern Africa; naturalized in south Florida. J.

9. *Chrysanthemum coronarium.* Garland daisy. Height: 1-3 feet. Has yellow or yellow and white daisylike flower heads to 3 inches across. Light green leaves are feathery and branches are upright. Summer flowering. A,B,F.

10. *Cleome hasslerana.* Spider flower. Height: 4-5 feet. This vigorous native of tropical America is good for the back of an informal border. Rose, purple, pink, or white 2-3-inch flowers with "spidery" stamens and seed pods. Half-hardy annual. Plant in full sun in a warm, dry location. Reseeds very readily. A,B,D,H.

11. *C. spinosa.* Similar to *C. hasslerana* but flowers are off-white. Native to southern Mexico, Venezuela, and Caribbean Islands. A,B,D,H.

12. *C. spinosa* **'Helen Campbell'.** Height: 4 feet. Compound leaves with spines at base. This variety has numerous white flowers with 1-inch-long petals and 2-3-inch stamens. Grows well in sun or partial shade and prefers a dry soil. Makes a good cut flower. In hot sunny weather the petals will curl during the day and open fully in the evening. A,B,D,H.

13. *C. spinosa* **'Violet Queen'.** Similar to *C. hasslerana* but with less showy, purple and off-white flowers. A,B,D,H.

14. *Cosmos sulphureus* **'Sunny Red'.** Height: 2 feet. A stunning scarlet single-flowering cosmos with a bushy habit. Colors turn orangish as plants mature. B,F,H.

15. *Cosmos* **spp.** Height: 2-3 feet. Bright yellow and orange flowers will bloom all summer and into late fall. Likes full sun and sandy soil. Rich soil may lead to lush growth and few flowers. Blooms less profusely in short-season climates. Deadhead to promote flowering and stake in windy unprotected situations. Native to North America. In the North A, elsewhere, B,F,H.

16. *Dolichos lablab.* Hyacinth bean. Height: 6-10 feet. Tender perennial vine grown as an annual. An ornamental member of the pea family. Flowers pinkish purple, about 1 inch long. The purple pod is 2 inches long with black or white seeds. The bean is edible but should be thoroughly cooked with 2-4 water changes. A,B,H.

17. *Dyssodia tenuiloba.* Dahlberg daisy. Height: 8 inches. Feathery, scented foliage and a rounded habit. Resembles a small marigold with a multitude of small golden yellow flowers. Blooms all summer. Grows in sand and gravely soil and is ideal for rock gardens or the front of borders or containers. Heat-tolerant. A,B,C,D,H.

18. *Emilia javanica.* Tassel flower. Height: 2 feet. Showy clusters of vivid scarlet ½-inch flowers. Likes a sunny site with dry or sandy soils. Drought tolerant. A long-lasting cut flower. A,B.

19. *Gaillardia* **spp.** Blanket flower. Donor unsure of species. Height: to 2 feet. Double daisylike flowers are deep yellow to red. One of the most heat- and drought-tolerant of all annuals. Removal of faded flowers will prolong bloom. Excellent cut flower. Early seed germination will ensure first year bloom. Zone 2. A,B,D.

20. *Gazania* × *hybrida* **'Sunbeam'.** Treasure flower. Height: 6-12 inches. Flowers red, yellow, orange, or pink on stems rising above foliage. Basal foliage forms small clumps. Blooms early summer to frost. Likes light soil. This perennial is generally grown as an annual, but can be moved indoors for winter months. Zone 9-10. A,B,E,F.

21. *Gomphrena globosa.* Globe amaranth. Height: 8-20 inches. Blooms midsummer to frost. Cloverlike white, pink, and reddish purple flower heads about an inch across. Among the best for dried arrangements. Tolerant of heat and drought. A,B,H.

22. *Gypsophila paniculata* **'Early Snowball'.** Baby's breath cultivar. Height: 3 feet. Tiny, airy white flowers create a cloudlike effect. Used for filler or dried arrangements. Double, ball-like flowers. Flowers can be cut at full bloom to dry for bouquets. Thin to 18 inches apart. B.

23. *Helichrysum bracteatum* **'Dwarf Hot Bikini'.** Strawflower cultivar. Height: to 3 feet. Colorful mix of bright yellow, red, orange, and white flowers. Excellent for dried arrangements. Very easy to grow. A,B,H.

24. *Impatiens balsamina.* Balsam impatiens, garden balsam. Height: 2½ feet. Bushy, with lance-shaped leaves, and bearing 2-inch-wide white and pinkish flowers. Blooms all summer into fall. Prefers semishade and moist soils. A,B.

25. *I. pallida.* Jewelweed. Height: to 5 feet. Toothed, ovate leaves 3½ inches long and bright yellow-orange flowers, some with dark reddish spots. Blooms summer to late fall. A.

26. *Ipomoea* **spp.** Morning-glory. Donor unsure of species. Prostrate or climbing habit, growing 10 feet or more. Showy blue flowers up to 5 inches across, turning pink to white. Easy to grow. Can be somewhat invasive. Excellent for training or interplanting with other climbers. A,B,H.

27. *Limonium sinuatum* **'Mixed Bold Colors'.** Sea-lavender cultivar. Height: 2-2½ feet. Vivid white, yellow, rose, lavender, and blue flowers are borne in papery sprays on stiff stems. Useful for dried arrangements. Start indoors 8 weeks before the last frost. A,H.

28. *Machaeranthera tanacetifolia (Aster tanacetifolius).* Tahoka daisy. Height: 2 feet. Dense, feathery foliage with compound flowers over two inches wide, varying from white to bluish violet. A,B,H.

## Save this catalog!

**Seed packets are marked by catalog number only, so it will be your only means of identifying the seeds you have selected.**

29. *Papaver rhoeas.* Corn poppy, Shirley poppy. Height: 2 feet. Cup-shaped flowers have silky, crimson petals that contrast with the dark centers. Blooms all spring and early summer. Excellent for spring color in borders. Will resow each year. B,H.

30. *Papaver* **sp.** Poppy. Donor unsure of species. Height: 1-2 feet. Multicolored, carnationlike double blooms. B,H.

31. *Papaver* **spp.** Poppy. Donor unsure of species. Height: 1-2 feet. Mixed colors, singles and doubles. Remove dead flowers to promote blooming. Tolerates poor or fairly dry soil. In climates with mild winters sow in fall. B.

32. *Rhynchelytrum repens.* Natal grass. Height: 3 feet. Grass has ¼-inch-wide leaf blades. Flower is a 6-inch-long, rosy pink panicle fading to pink and silver. Thrives in a sandy soil. Zone 3-8 as an annual, Zone 9 as a short-lived perennial. B,G,H.

33. *Scabiosa atropurpurea.* Pincushion flower. Height: 2 feet. Two-inch-wide flowers are mix of purple, rose, lilac, and white. This is a moderately fast-growing bushy plant. A,B,H.

34. *Sorghum bicolor.* Broomcorn. Height: 6-10 feet. Rapidly growing, coarse-textured annual used for making brooms. Sometimes puts out prop roots. Full sun or partial shade; particularly suited to the Great Plains. B,H.

35. *Tagetes erecta* **'Sugar and Spice Mixed'.** Marigold mix. Height: 20 inches. Easy to grow. Unbeatable ablity to ward off pests if planted near vegetable gardens. This is the first marigold mixture that includes the famous white marigold, as well as bright yellow, gold, and orange blooms. Fully double, carnation-type flowers up to 3½ inches across on sturdy compact plants. A,B,H.

36. *T. patula* **'Happy Days'.** Marigold cultivar. Height: 2 feet. Profuse double flowers are orange-red and yellow. Early blooming and heat tolerant. A superb plant for edging, borders, and window boxes. A,B,H.

37. *Tagetes* **spp.** Butterscotch marigold. Donor unsure of species. Bright butterscotch yellow flowers. Excellent for hot and dry areas and for keeping away pests if planted as a border around vegetable or kitchen gardens. A,B,H.

38. *Thunbergia alata* **'Susie Mixed'.** Black-eyed Susan vine cultivar. Treat as a tender annual. Climbing plant up to 6 feet. Showy orange, white, and yellow flowers with dark brown centers up to 2 inches wide. Excellent for trailing ground cover, hanging basket, or trellis. Does best with a support. Prefers warm sites. Slow germination. A,B,H.

39. *Tithonia rotundifolia* **'Goldfinger'.** Mexican sunflower cultivar. Height: to 6 feet. Daisylike, fiery orange flowers up to 3 inches wide. Bushy habit is excellent for back of a border or hedge. Often benefits from support for main stem. Deadhead regularly. A,B,H.

40. *Verbena × hybrida.* Height: 12 inches. Leaves are grayish green. Flowers are clusters of pink, purple, red, or blue, 2-3 inches in diameter with white centers. Seed is sensitive to high moisture so water the flat the night before planting rather than after planting. Can be grown as a short-lived perennial in frost-free regions. A,E,F.

41. *Verbesina encelioides.* Butter daisy, golden crown beard. Height: 3 feet. Herbaceous perennial grown as an annual. Has a loosely-branching habit and ovate, irregularly toothed leaves. Daisylike flowers are vivid yellow with toothed ray florets. Will attract bees, butterflies, and other insects. Tolerant of drought. Native to western North America and Mexico. B,H.

42. *Viola × wittrockiana* **'Swiss Giants'.** Pansy cultivar. Height: 7-12 inches. Showy white, yellow, and blue flowers are 4 inches wide. An excellent bedding or window box plant. Full to part sun. Heat tolerant but prefers moist soil. Can be sown in fall in nearly frost-free areas. A,E,F,K.

43. *Zinnia elegans* **'Rose Pinwheel'.** Zinnia cultivar. Height: 1-2 feet. Bushy plants with single daisylike blooms 3 inches wide. The flowers, which open pink and mature to a deep rose, are excellent for cutting. Resists mildew. Deadhead regularly. A,B,H.

For instructions on how to order seeds from the 1993 Seed Catalog, see page 11SC.

The following table provides germination information and requirements. For some seeds, more than one germination technique may be used. For example, A,B indicates that the seed may be sown indoors or outdoors. Some seeds require more than one treatment before germination can occur. For information about warm and cold stratification and scarification see page 8SC.

"H," which indicates that the seed is easy to germinate, does not necessarily mean that it is also easy to grow once it has germinated. If you are unfamiliar with a particular species, you may want to consult a horticultural reference book.

General seed germination and transplanting instructions will be included with your order.

- A May be sown indoors in flats.
- B May be sown outdoors where they are to grow.
- C Sow indoors in peat pots to minimize transplant shock.
- D Light recommended for germination.
- E Dark recommended for germination.
- F Cool temperature required for germination (55 to 60 degrees).
- G Warm temperature required for germination (80 degrees).
- H Easy to germinate.
- I Difficult to germinate.
- J No reliable germination information.
- K Sow in fall.

# Perennials

44. *Achillea millefolium.* Common yarrow. Height: 2 feet. Flat heads of rich red flowers bloom in summer above feathery dark green leaves. Will rebloom if dead flowers are removed. Good for dried arrangements. Needs full sun. Zone 3-10. A,B,H.

45. *Achillea* × **'Coronation Gold'.** Yarrow cultivar. Height: 2-4 feet. Easy to raise and fast-growing, with fernlike foliage and bright yellow flowers June to August. One of the most drought-tolerant perennials, it thrives in heat and well-drained soils. Zone 4-8. A,B,H.

46. *Actaea rubra.* Baneberry, snakeberry. Height: 20 inches. Clump-forming plant produces small, fluffy white flowers in spring, followed in fall by clusters of scarlet berries. Requires some shade and moist, slightly acid soil. This native is a good choice for shady borders and woodland gardens. Flowering will begin in its third year. Zone 3. B,E,I.

47. *Alcea* **spp.** Hollyhock. Donor unsure of species. Height: 6-8 feet. Spikes of pink, rose, and purple flowers 2-3 inches across. Requires staking. Plant in rich soil. Zone 2-3. A,B,F,H.

48. *Aletris farinosa.* Star grass, unicorn root. Height: 1-3 feet. Tall racemes bearing white flowers up to 3 inches wide. Pointed leaves are 8 inches long. Not terrifically showy, but makes a good choice for native plant gardens and semi-wild areas. Commonly found in acid soil, moist

or dry. Zone 5-10. A,B.

**49.** ***Anemone occidentalis.*** Windflower, lily-of-the-field. Height: 2 feet. Divided leaves with silky hairs, 1-inch-long white or purplish cup-shaped flowers. Full sun to part shade. Prefers humus-rich soil. Zone 5. A,B,K.

**50.** ***A. sylvestris.*** Windflower, lily-of-the-field. Height: 12-18 inches. Fragrant, nodding, white 1½-inch flowers. May rebloom frequently through summer and into fall. Has running roots and rapidly colonizes open woodlands in humus-rich soils. Plant in partial shade. Zone 3-9. B.

**51.** ***Angelica gigas.*** Height: 5-7 feet. Vigorous, erect plant has 3-6-inch-wide umbels of small white flowers. Leaves are divided into nine 2-to-3-inch leaflets. Prefers light shade and moist soil. As seeds do not retain capacity to germinate for long, it is recommended that they be sown indoors as early after collecting as possible. Transplant seedlings outdoors in spring. Zone 4-9. A,K.

**52.** ***Aquilegia vulgaris*** **'Biedermeier'.** Columbine cultivar. Height: 1 foot. Flowers are a mix of dark blue, violet, pink, and white with bluish green foliage. Can be quite variable from seed. Plant in a sandy well-drained loam with additions of organic matter, in full or partial sun. Zone 4. A,B,H.

**53.** ***A. vulgaris*** **'McKana's Hybrids'.** Columbine cultivar. Height: 2½ feet. Spurred, early summer flower in a mix of red, pink, white, yellow, and crimson. Good for naturalized settings. Needs full to part sun with good drainage. Zone 4. A,B,K.

**54.** ***Aquilegia*** **sp.** Columbine. Donor unsure of species. Same as above except flowers have shorter spurs and maximum height is 1½ feet.

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**55.** ***Aquilegia*** **spp.** Columbine. Donor unsure of species. Height: 3-3½ feet. Long spurs of vivid scarlet and yellow blooms late spring into early summer. Airy blue-green foliage and an elegant habit. Grows best in semishade and moist, rich, well-drained soil. Sow directly outdoors up to 2 months before frost or in early spring. If sown indoors, place in peat moss and refrigerate for 3 weeks and then germinate at 70-75 degrees. Zone 3. A,B,D.

**56.** ***Arisaema triphyllum.*** Jack-in-the-pulpit. Height: 16-20 inches. Named for green or purple hoodlike bracts (spathes), which are followed in autumn by bright red berries. Needs full or partial sun and rich soil. Zone 4-9. A,B,K.

**57.** ***Asclepias tuberosa.*** Butterfly weed. Height: 3 feet. Orange, occasionally red and yellow umbels bloom in late spring to midsumer. Attractive 2-6-inch-long straplike leaves. Excellent for borders or meadow areas. Thrives in drier, infertile soils. Usually pest free. Zone 4. A,B,E,H.

**58.** ***Aster linearifolius.*** Bristly aster. Height: to 2 feet. Composite blooms are 1 inch across, whitish in the center, with violet ray flowers. Blooms late summer to fall. Zone 4-9. A,B.

**59.** ***Begonia grandis.*** Hardy begonia. Height: 2-3 feet. Roughly heart-shaped leaves have reddish veins. Fragrant, light pink, 1½-inch flowers on short stems during summer. Partial shade in the south. Needs rich, moist soil. Great naturalizing plant. Zone 6. A,B,H.

**60.** ***Belamcanda chinensis.*** Blackberry lily. Height: 1½-3 feet. Bulb produces orange-red, spotted flowers to 2 inches across. Semierect, sword-shaped leaves form a fan. Midsummer flowers are followed by fruit capsules that split to expose shiny black seeds good for dried arrangements. Prefers rich soil. Should be protected during cold winters. Zone 5. A,B,H.

**61.** ***Campanula rapunculoides.*** Creeping bellflower. Height: 3 feet. Violet funnel-shaped flowers on long graceful racemes. Rampant spreader. Plant in isolated beds. Tolerates any friable garden soil. Zone 5. A,B,D,H.

**62.** ***Clematis recta.*** Height: 3-6 feet. Bush-forming herbaceous plant has ¾-inch sweetly scented white flowers in midsummer. Foliage is dark or gray green. Prune down to around 1 foot in early spring, since flowering occurs on new growth only. Zone 3-9. Q,S,I.

**63.** ***Codonopsis clematidea.*** Bonnet bellflower. Height: 2 feet. Twining stems with small oval leaves. In June and July, produces 1-inch bell-shaped flowers that are bluish white and edged with purple rings. Prefers semishade and light soil. Train over supports or leave to scramble among other plants. Zone 4. A,B,K.

**64.** ***Crambe cordifolia.*** Heartleaf crambe. Height: to 6 feet. Clouds of small fragrant white flowers borne in branching sprays in summer. Crinkled and lobed dark green leaves. Will tolerate partial shade. Zone 6-9. A,B,K.

**65.** ***Crocosmia × crocosmiiflora*** **'Lucifer'.** Montbretia cultivar. Height: 3 feet. Deep red flowers bloom along branching spikes in midsummer. Has clump-forming, swordlike bright green leaves. Needs an open, sunny site. Zone 5-9. A,B,K.

**66.** ***Cynara cardunculus.*** Cardoon. Height: 6 feet. Has large clumps of arching, pointed leaves. Produces bluish purple thistlelike flowers on stout gray stems in midsummer. Flower heads dry well. Requires sun and fertile soil. Zone 9-10. A,B.

**67.** ***Daucus carota.*** Queen-Anne's-lace. Height: 2-3 feet. Small white flowers borne in a flattened cluster with single reddish flower in center. Blooms from June to September. Fernlike, airy texture provided by finely cut leaves and slender stems. Prefers full sun and sandy soil. Popular in flower arrangements. Biennial. Zone 3. A,B,D.

**68.** ***Delphinium elatum*** **'Blue Fountains'.** Larkspur cultivar. Height: to 3 feet. A mixed dwarf strain. Prefers moist soil. Will flower first year if started indoors. Southern zones may see poor performance over time due to heat. Zone 4. A,B,E.

**69.** ***D. elatum*** **'Pacific Giants'.** Larkspur cultivar. Height: 4-6 feet. Flower spikes in blue, purple, pink, and white. Protection from wind and staking may be needed. Zone 4. A,B,E.

**70.** ***D. grandiflorum*** **'Dwarf Blue Butterfly'.** Larkspur cultivar. Height: 1 to 3 feet. Half-inch-wide, bright blue flowers bloom along 6-inch branching spikes. This short-lived bedding plant has finely divided leaves and prefers rich moist soil. Removal of faded flower spikes, along with feeding and watering, will encourage a second flush of flowers. Zone 4-9. A,B,E.

**71.** ***Delphinium*** **sp.** Larkspur. Donor unsure of species. Height: 4-6 feet. Erect habit with large 5- to 7-parted leaves. Extremely showy flowers bloom in early to midsummer on long spikes. Flowers in blue, red, pink, white, violet, and yellow. Prized as a cut flower. Needs staking and full sun in a moist, well-drained, preferably alkaline soil. Zone 4. A,B,E.

**72.** ***Dianthus barbatus.*** Sweet William. Height: 2 feet. Abundant red, pink, white, and violet fringed flowers. Excellent for rock gardens. Usually treated as a short-lived perennial or biennial. If seed is sown in early summer, it should flower the following year. Makes a long-lasting cut flower. Prefers rich, moist, well-drained soil. Zone 4-10. A,B,H.

**73.** ***D. barbatus*** **'Excelsior Mixed'.** Sweet William cultivar. Similar to the previous entry.

**74.** ***D. deltoides.*** Maiden pink. Height: 4-15 inches. Low growing with grasslike leaves. Flowers are red or pink with crimson eyes. Plant in full sun in light, sandy soil. Zone 2-3. B,H.

**75.** ***Dicentra eximia.*** Turkey corn, wild bleeding-heart. Height: 1 foot. During late spring and summer, pink flowers hang from slender stems. Fernlike foliage is gray green and finely cut. Likes rich, moist, well-drained soil and semishade. Zone 4-8. A,P,F or K.

**76.** ***Digitalis purpurea.*** Common foxglove. Height: 2-4 feet. Extremely showy, tube-shaped, terminal flowers are purplish pink with brown-spotted throats. Blooms early June to mid-July. Self-sows. Seeds sown outdoors in early fall or

started in a greenhouse during winter should flower the following summer. Likes part shade and a rich soil. Zone 4. A,B,G,H.

77. ***Echinops ritro.*** Globe thistle. Height: 4 feet. Erect stands of sturdy stems with thistlelike leaves. Flowers are tightly grouped into large, spherical, compound heads. Easy, undemanding plant for a sunny location. Excellent for cutting and dried arrangements. Zone 4-10. B,H.

78. ***Echinops* sp.** Globe thistle. Donor unsure of species. Height: 3-6 feet. Taller and hardier than *E. ritro*. Zone 3-10. B,H.

79. ***Eremurus stenophyllus (E. bungei).*** Desert-candle. Height: 3½ feet. Small, canary yellow flowers have orange stamens and grow in dense clumps up to 15 inches long. Wedge-shaped leaves are 1 inch wide. Needs up to 5 years to bloom. Well-drained soil a must. Can be started and grown in containers for 12-18 months. Zone 5. A,B,E,K.

80. ***E.* × *isabellinus* 'Shelford Hybrids'.** Desert-candle hybrid. Height: to 5 feet. Long racemes of orange, buff, pink, or white flowers are borne freely in midsummer. Requires a sunny, warm site. New shoots need frost protection in early spring and fall. May need staking. First blooms will appear in third year. Zone 5. A,B,E,K.

81. ***Erigeron pulchellus.*** Fleabane. Height: 2 feet. Finely textured plants resemble asters. Basal leaves are up to 5 inches long, while stem leaves are about half that length. Both are lance-shaped. Yellow flower heads about 1½ inches across have blue, pink, or white rays. Zone 5-8. B,H.

82. ***Eryngium giganteum.*** Stout sea holly. Height: 3-4 feet. Large, thistlelike blue flowers with broad spiny silver bracts appear in late summer. Heart-shaped basal leaves. This biennial dies after flowering, but will self-seed. Zone 3. A,B,K.

83. ***E. yuccifolium.*** Rattlesnake master. Height: 3-4 feet. Rounded flowers are whitish, 1 inch across. Taller branches are leafless with few bracts. Prefers dry, slightly acid soil and needs generous topsoil depth to accomodate a long taproot. Performs well in both shady woodland edges and sunny prairie settings. Good for dried arrangements. Zone 4. B,I,P.

84. ***Erysimum* spp.** Wallflower. Donor unsure of species. Height: 1 foot. Slow-growing, evergreen bushy perennial has lance-shaped leaves. Brilliant orange, 4-petaled, scented flowers appear in spring. Needs full sun. Best treated as a biennial. Zone 3. A,B,F.

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85. ***Eupatorium purpureum.*** Joe-pye weed. Height: to 10 feet. Open clusters of purplish flowers appear in late summer. Tolerates varied sun and soil conditions. Zone 4. A,B.

86. ***Foeniculum vulgare.*** Florence fennel. Height: 6 feet. Summer blooms are large, flat umbels of small yellow flowers. Has fine hairlike bronze leaves that are decorative and flavorful. Flower heads should be removed as they fade to prevent self-seeding. Zone 4-9. B,H,K.

## Avoiding Damping Off

Damping off disease is the most common problem that can occur when starting seed. Seeds germinate and seedlings look healthy then suddenly wilt and die for no obvious reason. This sudden death is caused by fungi in the soil. It could be *Rhizoctonia, Pythium, Botrytis,* or *Phytopthora.* The fungus may be present in the soil medium, seeds themselves, or in water. Damping off occurs most often when soil and air temperatures are above 68 degrees. Especially if you will be starting your seeds in a warm room, make sure that you take the following precautions:

1. Do not overwater seedlings.
2. Do not overcrowd seedlings. Thin out as soon as seedlings begin to crowd each other.
3. Use a sterile growing medium with good drainage.
4. Never use garden soil dug from your yard.
5. Thoroughly wash all seed flats and use a solution of Benomyl fungicide (½ teaspoon per gallon water) to drench seed flat and soil medium before sowing.

87. ***Galtonia candicans.*** Summer hyacinth. Height: 3-4 feet. Elegant spikes of drooping, funnel-shaped white flowers in July and August. Needs a sunny, protected spot and fertile soil that will not dry out in summer. Semierect, strap-shaped basal leaves die back in winter. May be lifted and replanted in spring. Zone 8. A,B.

88. ***Gerbera jamesonii.*** Transvaal daisy. Height: 2 feet. Daisylike, orange-red flower heads are borne singly on long stems. Has basal rosettes of large, jagged, evergreen leaves. Excellent cutting flower. Needs full sun and light sandy soil. Zone 8-10. A,B,D,H,K.

89. ***Helianthus* × *multiflorus.*** Sunflower. Height: 5 feet. Large yellow flower heads borne by thick stalks with large leaves. May need staking. Blooms late summer to early autumn. Zone 5-9. A,B,H,K.

90. ***Hemerocallis* cultivars.** Daylily. Donor unsure of cultivars. Height: 1½-3½ feet. A mix of yellow, orange, pink, red, maroon, salmon, and several bicolor flowers that begin appearing about midsummer. Germination will take from 3-7 weeks. Full sun to part shade with rich soil. Zone 4. A,B,C,H,K.

91. ***Hesperis matronalis.*** Sweet rocket. Height: 1-3 feet. Showy white, purple, to light blue fragrant flowers produced in loose terminmal racemes. Blooms in May and June. Self-seeds prolifically. If seeds are started in winter or early spring, plants will bloom the first year. Does best with light shade and damp, well-drained soil. Zone 2-3. A,B,D,G,H.

92. ***Hibiscus coccineus.*** Scarlet rose mallow, Texas star hibiscus. Height 6-8 feet. Deep red funnel-shaped flowers, 5-6 inches wide, appear from mid- to late summer. Narrow upright growth habit. It is native to wetlands, but will tolerate drier soils. Full sun to light shade. Zone 6-9. B.

93. ***H. militaris* 'Alba'.** Halberd-leaved rose mallow. Height: 3-7 feet. Erect, multi-stemmed plant. White to pale pink flowers are 3-4 inches wide with red centers. Plant in moist area. Zone 4-9. A,G,H.

94. ***H. moscheutos.*** Common rose mallow. Height: 3-8 feet. Impressive 6- to 12-inch flowers are red, white, pink, or bicolor. Its many stems and 8-inch leaves give it a shrubby form. Full or partial sun and moist, rich soil. Zone 5. A,G,H,K.

95. ***H. moscheutos* subsp. *palustris.*** Marsh mallow, sea hollyhock. Height: 3-8 feet. White, pink, and rose flowers. Leaves are rounded and 3-lobed. Hairy fruits. Zone 4-9. A,G,H.

96. ***Hibiscus* sp.** Donor unsure of species. Pink flowering, with seeds similar to *H. moscheutos.* Zone 4. A,T,D,

97. ***Hibiscus* sp.** Donor unsure of species. Same as above only flowers are all white. Zone 4. A,T,D.

98. ***Hosta ventricosa.*** Blue plantain lily. Height: 3 feet. Dark green leaves are up to 9 inches long and 5 inches wide. Bell-shaped late summer flowers are violet-blue on 3 foot stems. Plant in shade. Zone 3. A,B,H.

99. ***Iris pseudacorus.*** Yellow iris. Height: 5 feet. Yellow-flowered iris with blue-green foliage. Grows best in moist areas. Blooms late spring. Zone 6. B,K.

100. ***I. spuria.*** Butterfly iris. Height: 2 feet. Stiff foot-long leaves and blue-purple or lilac flowers. Full or partial sun with moist soil. Zone 4-9. B,H.

101. ***Kniphofia* sp.** Torch lily, red-hot-poker. Donor unsure of species. Height: 2-4 feet. Thick, grasslike leaves. Dense racemes of glowing red, orange, or yellow flowers resemble torches or pokers. Blooms in summer. Well-drained soil a must. If seeds are sown directly in spring, flowering will not occur for 2-3 years. Zone 6. A,B

102. ***Liatris scariosa.*** Blazing-star, gayfeather. Height: 4-6 feet. Native American wildflower, excellent for borders and meadows. Unbranched leafy stems end in a dense, long-lasting spike of small purplish flowers. Excellent cut flower, fresh or dried. Needs moderately fertile, sandy soil. Zone 3-10. A,B.

103. ***L. spicata.*** Blazing-star, gayfeather. Height: 2-5 feet. Two-foot spikes of 5-14 rosy purple florets bloom on smooth stems. Drought resistant. Winter mulching is recommended in cold climates. Prefers moderately fertile, sandy soils that drain well in winter. Zone 3-10. A,B.

104. ***L. spicata* 'Alba'.** Blazing-star cultivar. Height: 2 feet. Similar to the previous entry but with off-white flowers. Zone 3-10. A,B

105. ***L. spicata* 'Kobold'.** Height: to 2 feet. Similar to *L. spicata* but with mauve pink flowers.

106. *Libertia formosa.* Height: 1½-3 feet. Three-quarter-inch flowers have three white inner petals and three greenish brown outer petals. Has evergreen, clump-forming grasslike leaves and slightly longer flower stalks. Needs full sun and moist soil. Mulch with compost or leaves over winter in cooler areas. Zone 9-10. A,B.

107. *Lilium lancifolium.* Yellow tiger lily. Height: to 5 feet. Has long, lance-shaped leaves along single erect stem. Produces several turk's-cap yellow flowers that have purple-spotted, 3-4-inch petals. Needs sun and well-drained soil. Zone 4-8. A,B.

108. *L. pumilum.* Coral lily. Height: 2 feet. Late spring turk's-cap flowers are glossy, sealing-wax red, 2 inches wide. Needs full sun and gritty or sandy alkaline soil. Short-lived but easily propagated. Popular cut flower. Zone 3. A,B,H.

109. *Lunaria annua.* Money plant. Height: 3 feet. Flowers are purple or white and fragrant. Fruit is silvery, papery, and coin-shaped. Useful for dried arrangements. Biennial but will reseed. Plant in full sun or light shade with a well-drained soil. Zone 6-9. B,H.

110. *Lupinus* spp. Lupine. Donor unsure of species. Height: 2-3 feet. Stately foot-long racemes of colorful pea-shaped flowers in early summer. Clump forming habit with deeply palmate, dark green leaves. An eye-catching plant for the back of the border or naturalized areas. Prefers cooler climates so mulch to keep summer soil cooler. Needs full sun and moist, well-drained, acidic soil. Zone 4-8. A,B,K.

111. *Lychnis chalcedonica.* Jerusalem campion, Maltese cross. Height: 2-3 feet. Lance-shaped 2-4-inch opposite leaves. Produces dense clumps of vivid scarlet flowers on tall stems in summer. Often needs staking. Full to partial sun. Requires a moist, well-drained, and fertile soil. Zone 4. A,B.


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112. *L. coronaria.* Rose campion. Height: 2-3 feet. Bright magenta pink flowers borne on long stems contrast beautifully with greenish white oval leaves that are 1-4 inches long. Blooms late spring into early summer. Needs full sun. Self seeds. Zone 5. A,B,H.

113. *L. coronaria* 'Atrosanguinea'. Rose campion cultivar. Same as above except flowers are dark red.

114. *Malva alcea* var. *fastigiata.* Hollyhock mallow variety. Height: 3-4 feet. Blooms in a mass of pink from July to October. Full to part sun. Short lived, but usually self-seeds. Zone 5. A,B.

115. *Meconopsis cambrica.* Welsh poppy. Height: 12-18 inches. Late spring flowers are 2 inches wide, lemon yellow or rich orange. Fernlike foliage. Needs shade and rich, slightly acidic soil. Does not like wet feet in winter or excessive heat in summer. Seed does not keep well but will self-sow. Zone 6-9. B.

116. *Miscanthus sinensis.* Eulalia, Japanese silver grass. Height: 8 feet. Upright clump of flat, 3-4-foot leaf blades. The leaves are ⅜-inch wide, tapering to a sharp tip. Pink to reddish, loose, feathery terminal flowers are 8-10 inches long, and appear in fall. Flower plume will stay throughout winter, which makes this a useful plant for winter interest in a garden. Zone 5. A,B,K.

117. *Oenothera erythrosepala.* Evening primrose. Height: 6 feet. Yellow blossoms open in the evening and begin to wilt by midmorning. More burst open the next evening. Sow seed in spring; plant will not bloom until the second summer. Full sun or light shade. Zone 5. B,H.

118. *O. missouriensis.* Missouri primrose, sundrops. Height 4 inches. Yellow summer flowers are bell-shaped and open at dusk. Has stout stems and oval leaves. Needs sandy soil. Zone 2-10. A,B,K.

119. *Papaver orientale.* Oriental poppy. Height: 2-4 feet. Twelve-inch fernlike foliage. Showy 4-6 inch flowers have dark centers and orangish red, white, scarlet, or pink petals. Their long stems make them look as if they were nodding in the wind. Blooms in late spring to early summer, the second year after sowing. Full to part sun. Zone 4. A,B,F.

120. *Pavonia lasiopetala* 'Rock Rose'. Rose mallow cultivar. Height: 3-4 feet. Many basal stems give shrubby form to this pink blooming perennial. Flowers are present from late spring to frost. Adapts to many soils and prefers full to part sun. Zone 6. A,B,H.

121. *Pennisetum* sp. Fountain grass. Donor unsure of species. Height: 3-4 feet. Arched, bright green leaves are 2-3 feet long and create a large mound. In fall, they turn golden brown. Flower spikes, which look like bottle brushes, are 5-7 inches long and are borne on 4 foot stems. Blooms in mid- to late summer. Zone 5. A,B,K.

122. *Penstemon grandiflorus.* Beard-tongue. Height: 2-4 feet. Very striking blue-green leaves with bell-shaped bluish lavender flowers in racemes on 8-inch erect stems. Considerable variation present in this species. Does well in dry soils. Zone 5. A,B,H.

123. *Phlomis russeliana.* Sticky Jerusalem sage. Height: 3 feet. Performs well as an evergreen ground cover, having large, heart-shaped basal leaves. Whorls of hooded, butter yellow flowers are borne along stout stems from June to early winter. Zone 5-9. A,B.

124. *Physalis alkekengi.* Chinese lanterns. Height: 2 feet. Brilliant orange-red fruits look like glowing Chinese paper lanterns. Angular, ovate leaves are 2-3 inches long. Prized for fall dried flower arrangements. Vigorous grower. Zone 4-8. A,B,K.

125. *Physostegia virginiana.* False dragonhead, obedient plant. Height: 4 feet. Impressive 6-10 inch racemes with 1¼ inch snapdragonlike flowers in rosy pink, lilac, and white. Called obedient plant because flowers stay in whatever position they are placed. Blooms in late summer. Excellent for shady borders or wildflower gardens. Full to part sun and moist, well-drained soil. Best to plant in spring. Zone 5. A,B,H.

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126. *Primula veris.* Cowslip. Height: to 1 foot. Small, rich yellow, sweet-scented flowers bloom in clusters from April into May. Crimped basal leaves are oval, green on top with fuzzy white undersides. Prefers a dry site. Zone 5. B,H.

127. *Rudbeckia fulgida* 'Goldsturm'. Black-eyed Susan cultivar. Height: to 30 inches. Golden yellow flowers with contrasting dark brown centers. The 'Goldsturm' cultivar has an erect form and narrow rough green leaves that form clumps. However, seed-grown plants will vary from the parent. Zone 4-9. A,B,H.

128. *R. hirta.* Black-eyed Susan. Height: 2-3 feet erect with rounded habit. Similar to *R. fulgida* but with broader leaves. Blooms summer to fall. Excellent for borders, bedding, and cut flowers. Easy to grow. Full sun to very light shade. Tolerates heat and dry soils very well. Biennial. Zone 4. A,B,H.

129. *R. triloba.* Thin-leaved coneflower. Height: 4½ feet. Distinguished from *R. hirta* by its smaller, more numerous flowers with shorter rays. Somewhat invasive. Zone 4. A,B,K,H.

130. *Salvia farinacea* 'Victoria'. Mealy-cup sage cultivar. Height: 3 feet. Oval, lance-shaped leaves and tubular, violet-blue flowers borne along many erect stems. Summer blooming. Needs sun and fertile soil. Grown as an annual in northern zones. Zone 7. A.

131. *Saponaria officinalis.* Bouncing Bet. Height: 3 feet. Rough green leaves are borne on erect stems. Pale pink or white flowers appear June to September on short stalks. Zone 4-8. A,B,H,K.

132. ***Silene regia.*** Royal catchfly. Height: 2-4½ feet. Early to midsummer, 1-inch flowers have brilliant red, notched petals. Prairie and forest-margin plant tolerates varied sun and soil conditions. Zone 6. A,B,H.

133. ***S. vulgaris.*** Bladder campion. Height: 2 feet. Clump-forming plant with erect and spreading stems and white flowers. Zone 6. A,B,H.

134. ***Talinum paniculatum.*** Jewels-of-Opar. Height: 1-2 feet. Bright pink flowers bloom on slender stems from late spring through summer. Requires sandy soil. Zone 6. A,B,H.

135. ***Tanacetum parthenium (Chrysanthemum parthenium).*** Feverfew. Height: 18 inches. Has lobed, aromatic leaves and daisylike white flowers that bloom from summer to early autumn. Short-lived; sometimes grown as an annual. Zone 4-9. J.

136. ***Verbascum blattaria.*** Moth mullein. Height: to 6 feet. Outstanding columnar habit makes this plant excellent for back of borders or specimens. Lovely 1-inch yellow flowers with lavender colored base. Woolly, grayish blue leaves contrast well with brightly colored flowers. Does not do well in wet or cold soils. Biennial but self-sows to bloom the following year. Zone 5-9. A,B,H,K.

137. ***V. chaixii.*** Mullein species. Height: 3 feet. Summer flowers are 5-lobed, slender yellow spires with purple stamens. Erect in form, with toothed oval leaves, and covered in silvery hairs. Zone 5-9. A,B,D,G.

138. ***V. thapsus.*** Common mullein. Height: to 6 feet. Soft toothed leaves are 1 foot long. One-inch yellow flowers form clusters along dense erect spikes. Tolerates dry soil. Biennial. Zone 5-9. A,B,D,G.

139. ***Wisteria sinensis.*** Chinese wisteria. Height: climbs up to 30 feet or more. Woody stemmed vine. Somewhat fragrant, bluish violet flowers bloom in pendulous racemes in May. After flowering it develops velvety seed pods. Grow on a sturdy structure. Plant in moist, deep, well-drained soil. Zone 5-8. A,F,U,V.

# Wildflower Mixtures

The following wildflower mixtures have been donated by the Applewood Seed Company in Golden, Colorado, a wholesale seed company that specializes in native and wildflower meadow plants. The mixes contain 16 to 25 species of approximately 40 percent perennials, 20 percent biennials, and 40 percent annuals. Each packet contains enough seed for approximately 100 square feet. If less space is available, seed can be more densely sown, but may need to be thinned as plants develop. Please add $1 postage to your total payment if ordering wildflower mixtures.

## Planting Instructions

Sow seeds on a patch of prepared bare ground from which all weeds and grasses have been removed. Sow in early spring when your area normally has rainfall ample to keep your planting area moist. Seeds can be sown in early summer as long as sufficient moisture is available for at least four to six weeks after sowing.

Broadcast seeds evenly by hand over the area and rake to lightly cover with one-eighth inch of soil. Thoroughly soak the planting area. Maintain consistent moisture for four to six weeks or until plants are established, at which point watering can be reduced. Pull weeds as soon as they can be identified. Do not fertilize unless soil is extremely poor since fertilizer will only encourage weeds and excessive foliage at the expense of flowering.

**140. Knee-high Wildflower Mix.** A mixture of annuals, biennials, and perennials 6-24 inches high. This mix is designed to suit the needs of suburban or urban areas where lower plantings are preferred. This is an excellent mix to plant in front of a house, fence, or wall. Flowers come in various shades of pink, red, yellow, white, blue, orange, lavender, and purple. These flowers include flowering flax, globe candytuft, prairie flax (*Linum perenne* subsp. *lewisii*), rocket larkspur, wallflower, annual baby's-breath, dwarf cornflower, California poppy, lance-leaved coreopsis (*Coreopsis lanceolata*), gaillardia, and corn poppy.

**141. Low-growing Wildflower Mix.** A mixture of annuals, biennials, and perennials 6-16 inches high. A mix suited for walkway areas, driveways, or wherever low growth is desired. Included are globe candytuft, dwarf coneflower, wallflower, California poppy, cape marigold (*Dimorphotheca sinuata*), annual baby's-breath, sweet alyssum, California bluebell, dwarf lance-leaved coreopsis (*Coreopsis lanceolata*), calliopsis (*C. tinctoria* 'Nana'), spurred snapdragon (*Linaria maroccana*), dwarf yellow evening primrose (*Oenothera missouriensis*), Iceland poppy, dwarf garden catchfly (*Silene armeria*), garden forget-me-not, and viola (*Viola cornuta*). Flower colors include yellow, orange, white, blue, pink, lavender, and purple.

**142. Midwest Wildflower Mix.** Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, Wisconsin, southern Manitoba, and Ontario. Mix of 24 species including baby's-breath, black-eyed Susan, globe candytuft, prairie coneflower (*Ratibida columnifera*), purple coneflower, lance-leaved coreopsis (*Coreopsis lanceolata*), cornflower, oxeye daisy, dwarf yellow evening primrose (*Oenothera missouriensis*), flowering flax, annual gaillardia (*Gaillardia pulchella*), wild lupine (*Lupinus perennis*), corn poppy, and others.

**143. Northeast Mix.** Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, Washington, D.C., West Virginia, Maritime Provinces, and Quebec. Twenty-two species including New England aster, baby's-breath, black-eyed Susan, purple coneflower, lance-leaved coreopsis (*Coreopsis lanceolata*), flowering flax, foxglove, gayfeather (*Liatris spicata*), gilia (*Ipomopsis rubra*), rocket larkspur, corn poppy, spurred snapdragon (*Linaria macroccana*), and others.

**144. Southeast Mix.** Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, eastern Oklahoma, South Carolina, Tennessee, and eastern Texas. Twenty-one species including sweet alyssum, baby's-breath, bird's-eyes, black-eyed Susan, purple coneflower, four-o'clock, annual gaillardia (*Gaillardia pulchella*), gayfeather (*Liatris spicata*), gilia (*Ipomopsis rubra*), rocket larkspur, wild lupine (*Lupinus perennis*), tree mallow (*Lavatera trimestris*), and others.

**145 Southwest Mix.** Arizona, southern California, southern Nevada, and New Mexico. Twenty-one species including Tahoka daisy (*Machaeranthera tanacetifolia*), farewell-to-spring (*Clarkia unguiculata*), prairie coneflower (*Ratibida columnifera*), calliopsis (*Coreopsis tinctoria*), cornflower, prairie flax (*Linum perenne* subsp. *lewisii*), flowering flax, penstemon (*Penstemon strictus*), California poppy, corn poppy, tidy-tips, yarrow (*Achillea* spp.), and others.

**146. Western Wildflower Mix.** Colorado, Idaho, western Kansas, Montana, western Nebraska, northern Nevada, North Dakota, eastern Oregon, South Dakota, Utah, eastern Washington, and Wyoming. Twenty-four species including Tahoka daisy (*Machaeranthera tanacetifolia*), prairie coneflower (*Ratibida columnifera*), calliopsis (*Coreopsis tinctoria*), tri-color daisy (*Chrysanthemum carinatum*), dwarf yellow evening primrose (*Oenothera missouriensis*), prairie flax (*Linum perenne* subsp. *lewisii*), annual gaillardia (*Gaillardia pulchella*), perennial gaillardia (*G. aristata*, wild lupine (*Lupinus perennis*), penstemon (*Penstemon strictus*), California poppy, yarrow (*Achillea* spp.), and others.

## Think Thin

Whether sown indoors or outdoors, most seedlings will need to be thinned. Crowded seedlings and plants do not grow well because they compete with each other for light, moisture, and nutrients. Crowding decreases good air circulation which can lead to disease. When thinning plants in containers, use small sharp scissors to cut the plants off at soil level. Never pull up a seedling, which can damage or disturb the roots of nearby plants. A general rule of thumb is to thin enough seedlings so the leaves of remaining seedlings are not touching each other. When sowing extremely tiny seeds you will be better able to disperse them if you first mix the seed with three or four times its volume of fine horticultural vermiculite.

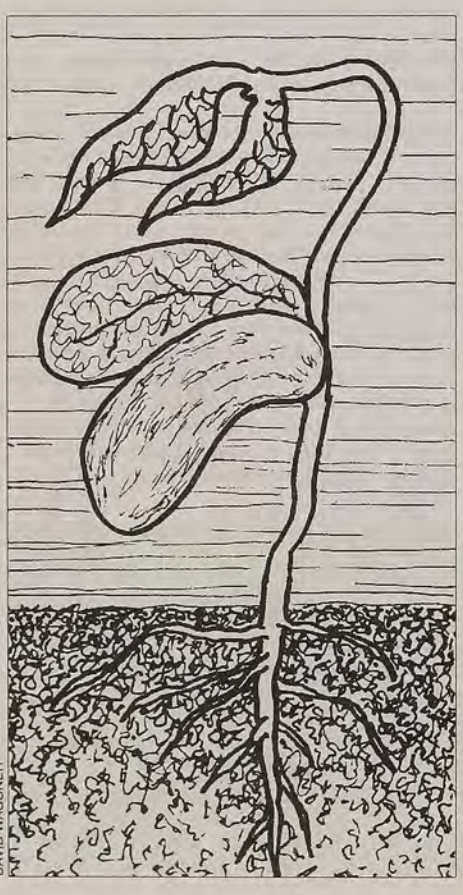
# Trees and Shrubs

**147.** ***Abies balsamea.*** Balsam fir. Height: 45-75 feet. Conical to pyramidal shape spreading to 25 feet with lustrous dark green needles and 2-4-inch seed cones. This slow-growing fir prefers moist, acidic soils. Does not tolerate heat, drought, or pollution. Zone 3-6. Cold stratify seeds in moist peat for 2-3 weeks, container sow, then transplant. B,K.

**148.** ***Acer ginnala.*** Amur maple. Height: 20 feet. Multi-stemmed shrub or tree of a roundish habit. Doubly serrated 3-inch leaves are often purple when young. Mature leaves are lustrous green on top, light green underneath. Fall foliage is scarlet and yellow. Panicles of yellowish white fragrant spring flowers unfurl with the leaves and are followed by 1-inch-long winged fruits that persist into late fall. Native to Asia. Zone 5. L,Q,B or S,Q,B.

**149.** ***Albizia julibrissin.*** Silk tree. Height: 40 feet. Deciduous with spreading crown. Alternate leaves 9-12 inches long with a graceful lacy appearance. One-inch, pink, spiky cylindrical flowers appear near the ends of branches. Pods hang for some time before falling. Flowers best in full sun, but will grow in part shade with average soil. Drought tolerant. Zone 6-9. Sandpaper scarify then soak in hot water for 24 hours before planting. A,B,Q,S,T,K.

**150.** ***Cedrus libani.*** Cedar of Lebanon. Height: 75-120 feet. Trunk circumference to 50 feet. Spreading horizontal branches with lower branches sweeping the ground. Pyramidal when young, flat topped at maturity. Rich green foliage. Needlelike leaves 1 inch long with barrel-shaped 4-inch cones. Requires full sun, open site, and well-drained sandy loam. Does not tolerate pollution. Zone 5-7. B,H,O.



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**151.** ***Cephalotaxus harringtonia.*** Japanese plum yew. Height: to 30 feet. Spreading evergreen usually wider than high. Rich, dark green 1½-inch leaves. Superior evergreen for shade and heat of the South. Prefers moist, well-drained soil. Zone 5-9. B in fall, Q.

**152.** ***Cercis canadensis.*** Eastern redbud. Height: 20-30 feet. Ascending branches with new leaves of reddish purple color that mature to a lustrous green. Springtime display of reddish purple buds along branches. Yellow fall foliage. Develops 2-3-inch true pods in late fall. Full sun to light shade with moist, well-drained soil. Seeds have a very tough exterior. Zone 4-9. T,P.

**153.** ***Chionanthus virginicus.*** Fringe tree. Height: 12-20 feet. Gray bark, medium to dark green leaves often lustrous above and paler underneath, and turning yellow or gold in fall. Lacy, white, fragrant flowers are borne in 6-8 inch panicles in May and June. By late summer, dark blue grapelike fruits with a stony seed appear. Excellent in groups or borders. Pollution-tolerant. Prefers moist, deep, rich, acidic soil. If sown outdoors in fall, will germinate the second spring. Zone 3-9. I,A,B,M, then Q,K.

**154.** ***Colutea arborescens.*** Bladder senna. Height: 6-8 feet. Very vigorous bushy shrub. Produces yellow, ¾-inch flowers on to 1-4 inch racemes in June and July, followed by bladderlike 3-inch seed pods July-September. Zone 5-7. T.

**155.** ***Ephedra nevadensis.*** Mormon tea. Height: 6-7 feet. Distinctive, freely branching shrub can be erect, climbing, or trellised. Habit similar to broom. Native to arid regions of western United States and Mexico. Prefers porous, slightly dry soil. During winter needs to be in a greenhouse with a minimum temperature of 40 degrees. Seeds need no pretreatment. Zone 6-9. A,B.

**156.** ***Eriobotrya japonica.*** Loquat. Height: 20-25 feet. Evergreen shrub or small tree. Fragrant, rich, glossy foliage with 1½-inch whitish flowers that hang in terminal panicles 6-10 inches long. Widely cultivated in tropics for its fruit, which will only develop in frost-free regions. Full to part sun. No pretreatment needed. Zone 4-7. A,B.

**157.** ***Fothergilla major.*** Large fothergilla. Height: 6-10 feet. Multi-stemmed shrub with showy white, sweetly fragrant flowers in late April to May. Dark green foliage turns yellow, orange, and scarlet in fall. Rarely troubled by diseases or pests. Must have acid soil. Full to part sun. Zone 4-8. N,Q.

**158.** ***Hibiscus syriacus.*** Rose-of-Sharon. Height: 8-12 feet. Stiffly erect shrub with showy single, 3-inch pink purple flowers late summer or fall. Yellowish fall foliage. One of the best *Hibiscus* species for northern gardens, and very easy to grow. Makes a good hedge or screen. Full to part sun. Zone 5. A,B,H.

**159.** ***Juglans ailantifolia* var. *cordiformis.*** Heart nut. Height: 60 feet. Stout-branched tree with rounded crown. Fifteen-inch toothed leaflets and large flat heart-shaped nut. Eating quality superior to other Asian walnuts. Dry seeds must be sown when ripe or be stratified and sown the following spring. Zone 4. A,B,R.

**160.** ***Libocedrus decurrens.*** Incense cypress. Height: to 100 feet. Evergreen tree with short, flattened branchlets with 1-inch-long seed cones. Native to West Coast. Zone 6. A,B,P.

**161.** ***Lupinus arboreus.*** Tree lupine. Height: 3-8 feet. Ornamental shrub for mild climates. Short-stalked palmate leaves. Ten-inch racemes of summer flowers, usually yellow, are followed by 3-inch pods containing 8-12 seeds. Easy to grow and tolerant of poor soils, as long as they are well drained. Sow in July or August. Zone 8-10. A,B,S,T.

**162.** ***Magnolia grandiflora.*** Southern magnolia. Height: 30-80 feet. A densely pyramidal, low-branching, stately evergreen with 8-inch glossy

Tree seeds frequently need extra treatment. In the wild, many will not germinate unless they have been subjected to a minimum amount of hot and/or cold weather, or until they have been gnawed or even digested by animals.

A period of exposure to warm or cold is called stratification. Seeds that require cold stratification should be sealed in a plastic bag with a small amount of moist (but not wet) sphagnum moss or peat moss. Tie the bag closed and place in a refrigerator at 38 to 40 degrees for the time indicated, which may be from one to four months.

Seeds requiring a period of warmth before the cold stratification treatment are treated exactly as for cold stratification except they they are stored at a temperature of 70 to 80 degrees for some period of time. Simply bringing seeds indoors for the specified time is often sufficient.

Scarification is the process of softening or breaking an especially hard or thick seed coat. The seed coat may be rubbed with sandpaper or a small file or soaked in hot water. Soak the seed in five times its volume of hot water (180 to 212 degrees) for 24 hours. The hot water is poured over the seed and allowed to cool.

| | |
|---|---|
| L | Warm stratification of 2 months. |
| M | Warm stratification of 3 months. |
| N | Warm stratification of 6 months. |
| O | Cold stratification of 1 month. |
| P | Cold stratification of 2 months. |
| Q | Cold stratification of 3 months. |
| R | Cold stratification of 4 months. |
| S | Scarification. |
| T | Hot-water soak. |

leaves and large 6-12 inch creamy white flowers in May-June. Flowers are followed by rusty brown, conical seed heads 6-8 inches long that split open in October and drop scarlet seeds. Fruits heavily in the south. Zone 6-9. A,B,R or 10-day water soak.

163. *M. macrophylla.* Bigleaf magnolia. Height: to [illegible] ves. Cre[illegible] tful frag[illegible] pec- ime[illegible] in fertile, moist but well-drained soil. Zone 7-9. A,Q or B in fall.

Sorry, Not Available

164. *Mahonia nervosa.* Oregon grape. Height: 12-18 inches. Low-growing evergreen shrub with 3-inch leaflets. Suckers and spreads freely. Yellow flowers from 8-inch racemes and ¼-inch purplish blue berries. Part shade. Prefers acidic, moist but well-drained soils. Keep seed lightly moist before stratification. Zone 4-8. Q.

165. *Myrica pensylvanica.* Bayberry. Height: to 12 feet. Upright-rounded, dense habit. Deciduous to semi-evergreen with dark green oblong hairy 4-inch leaves that are aromatic when bruised. Male catkins and flowers appear in March-April before leaves. Gray waxy fruits on stems of female plants. High salt tolerance. Remove wax coat and stratify in peat. Zone 2-6 A,B,Q.

166. *Osmanthus heterophyllus.* Chinese holly. Height: to 20 feet. Hollylike, spiky leaves, tending to become oval on upper branches as the plant ages. White, extremely fragrant autumn flowers. Dense, upright habit. Makes a superior screen or hedge. Full sun to part shade. Prefers fertile, moist, well-drained acidic soils. Slow to germinate. Seed needs no pretreatment. Zone 7-9. A,B.

167. *Picea pungens* var. *glauca.* Blue spruce. Height: 90-135 feet. Broad, dense, pyramidal growth with horizontal branches. Becomes more open with age. Blue-green needles and cylindrical, 2-4-inch cones. Moist or dry soils. Zone 2-7. A,B,P.

168. *Pinus contorta* var. *latifolia.* Lodgepole pine. Height: 70-80 feet. Tends to be round-topped and fairly dense. Needles and cones both about 2 inches long. Adapts to either boggy or dry soils. Seeds need no pretreatment. Zone 4. A,B.

169. *P. ponderosa.* Ponderosa pine. Height: 60-100 feet, with a 25-30 foot spread. An important timber tree in the West. Narrow pyramidal habit when young, maturing to a more cylindrical form. Dark to yellow-green needles are 5-10 inches long; cones are 3-6 inches long. Fairly fast grower. Needs full sun and deep, moist, well-drained, loamy soil. Seeds need no pretreatment. Zone 3-7. A,B.

170. *P. radiata.* Monterey pine. Height: to 60 feet. Extremely valuable for seaside plantings. Irregular but handsome open habit with 4-6-inch needles, 3-6-inch seed cones. Native to southern California. Needs slightly dry soil. Zone 7. B,T.

171. *P. strobus.* White pine. Height: to 120 feet. Mature crown is composed of several horizontal and ascending branches. Bluish green needles are 5 inches long. Cones are dark gray brown and 6 inches long. Intolerant of air pollution and salt. Zone 3. B,Q, or K.

172. *Pseudotsuga menziesii* var. *glauca.* Douglas fir. Height: to 300 feet. Best suited to northern gardens. A superior ornamental evergreen with soft, bluish green needles and 4-inch pendulous seed cones. Dense pyramidal shape with lovely ascending branching habit. Prefers neutral to acidic, moist but well-drained soils and high humidity. Zone 4-6. T,B in spring.

173. *Pyrus calleryana.* Callery pear. Height: 15-30 feet. Erect, narrow habit with upswept branches. Small, white 3-inch flower clusters appear in spring before leaves, producing a cloudlike effect. Leaves are 3 inches long, lustrous and finely toothed, turning yellow to red in fall. Grown as an ornamental, and not for its russet, ½-inch-long fruits. Seeds from 'Bradford' cultivar will differ from parents. Zone 6. A,B,Q.

174. *Rhamnus purshiana.* Cascara buckthorn. Height: to 20 feet. Large, low branching, deciduous shrub or tree. Flowers are umbel-shaped and finely toothed leaves are 8 inches long. Quarter-inch black fruits attract birds. Tolerates urban conditions. Zone 7. Q,A.

175. *Sequoia sempervirens.* Redwood. Height: over 370 feet in nature, but in eastern landscapes, perhaps only 60 feet. Native to the West Coast. One of the world's largest and most majestic trees. Densely branched and pyramidal in youth, it develops an open habit at maturity. Seed loses viability quickly, but requires no pretreatment. Sow outdoors, after last frost; provide partial shade for the first growing season. Zone 7-9. B.

176. *Sequoiadendron giganteum.* Giant sequoia. Height: to 300 feet in nature but only to 60 feet in eastern landscapes. Pyramidal habit in youth; at maturity, loses its lower branches but retains a pyramidal crown. Thick, blue-green needles are only ⅛-½ inch long. Cones are 1½-3 inches long. Needs a deep, moist, acidic, well-drained soil and high humidity. Will not perform as well in the East as it does in the Northwest. Zone 6-8. T,P.

177. *Viburnum sieboldii.* Siebold viburnum. Height: 10 feet. Of open habit and deciduous, with 6-inch, shiny, toothed leaves, paler underneath. Creamy white May flowers in 4-inch-long panicles of flat-topped clusters. Fruits are rose red, ripening to blue-black. Likes acidic soil. Zone 5. A,B,L,Q.

178. *Vitex agnus-castus.* Chaste tree. Height: 10-20 feet. Deciduous, aromatic shrub. Dark green leaves have velvety gray hairs underneath. Fragrant, pale lilac flowers in 7-inch spikes make a spectacular show through the summer. Attracts butterflies. This Mediterranean native likes heat. Zone 7. A,B,H.

# Herbs

179. *Allium schoenoprasum.* Chives. Height: 1-2 feet. Hardy perennial. Clusters of small bulbs produce bright, blue-green, narrow foliage used for salads and cooking. Rounded, pink to mauve flower heads appear in midsummer. Makes a nice edging for herb gardens, borders, or walkways. Zone 4. A,B,H.

180. *A. tuberosum.* Garlic chives. Height: 20 inches. Hardy perennial. Flat leaves have a delicate garlic flavor. Striking white flowers in late summer and early fall. Somewhat invasive. Zone 3. A,H.

181. *Allium* sp. Donor unsure of species. Another flowering onion similar to those listed above.

182. *Borago officinalis.* Borage. Height: 1-2 feet. Annual. Delicate bluish pink flowers are star-shaped with black stamens protruding from petals. Rough, hairy foliage grows to 6 inches long with a somewhat weedy appearance. Flowers and young tender foliage taste like cucumbers and are used for a "cooling effect" in wine drinks and salads. Flowers can be candied to decorate cakes. Will grow in any average soil. A,B,C,H.

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183. *Isatis tinctoria.* Woad. Height: 4 feet. Biennial. Flowers are yellow panicles. Yields a beautiful blue dye. Sprays of seed pods are useful in dried arrangements. A,B.

184. *Levisticum officinale.* Lovage. Height: 4-6 feet. Hardy perennial. Looks like a tall, much-branched celery with slender stems. Grows best in rich, moist soil. Prefers full sun, but will take some shade. Chop leaves and stem tips to flavor meats, salads, and soups. Zone 3. B.

185. *Mentha* × *piperita* var. *citrata.* Lemon mint. Height: 1-2 feet. Perennial. Erect, fast growing with lavender flowers appearing on short, thick spikes. Has citrus scent and flavor. Likes rich, moist soils. Zone 5. A,H.

186. *Myrrhis odorata.* Sweet Cicely. Height: 3 feet. Hardy perennial with soft anise-scented, fernlike foliage. White umbel flowers are borne above the foliage in May. Leaves can be used for seasoning, especially for fish and salads. Does not transplant well once established. Plant young seedling or sow seed directly where it is to grow. Likes shade and good humusy soil. Has a long germination time. Zone 3. A,B,K.

187. *Ocimum basilicum.* Sweet basil. Height: 1-2 feet. Annual. Bright green foliage and tiny, whorled, white flowers. Aromatic herb used in minestrone, vegetable dishes, tomato sauces, pesto, and other Italian dishes. Pinch back new leaves and flower buds to produce more growth and a bushier habit. Prefers a warm location with a moist, well-drained soil. A,B,H.

188. *O. basilicum* 'Citriodorum'. Lemon-scented basil. Annual. Height: 12-18 inches. Bushy habit. White tubular flowers. Excellent for vinegars. Care the same as for sweet basil.

189. *Salvia clevelandii.* Cleveland sage. Perennial. Height: 3 feet. Fragrant shrub with grayish 1¾-inch leaves, blue ¾-inch flowers. Can be used like rosemary in cooking. Prefers dry soils and low humidity. Native to southern California. Zone 9. A,B.

190. *Salvia officinalis.* Garden sage. Height: 1-2 feet. An aromatic, evergreen subshrub with oblong, gray green woolly leaves. Short racemes of blue-purple flowers are borne in summer. Foliage is used in both cooking and medicine. Needs fertile soil. Zone 6-9. A,B.

191. *Thymus vulgaris.* Common thyme. Height: to 12 inches. Hardy perennial. A favorite herb for seasoning poultry and savory dishes. An evergreen ground cover, it has oval shaped leaves and produces blue-violet and white flowers in spring and early summer. Prune plants to keep a bushy habit. Needs full sun with dry soil. Germinates in 21-30 days. Zones 6-9. A,B,F.

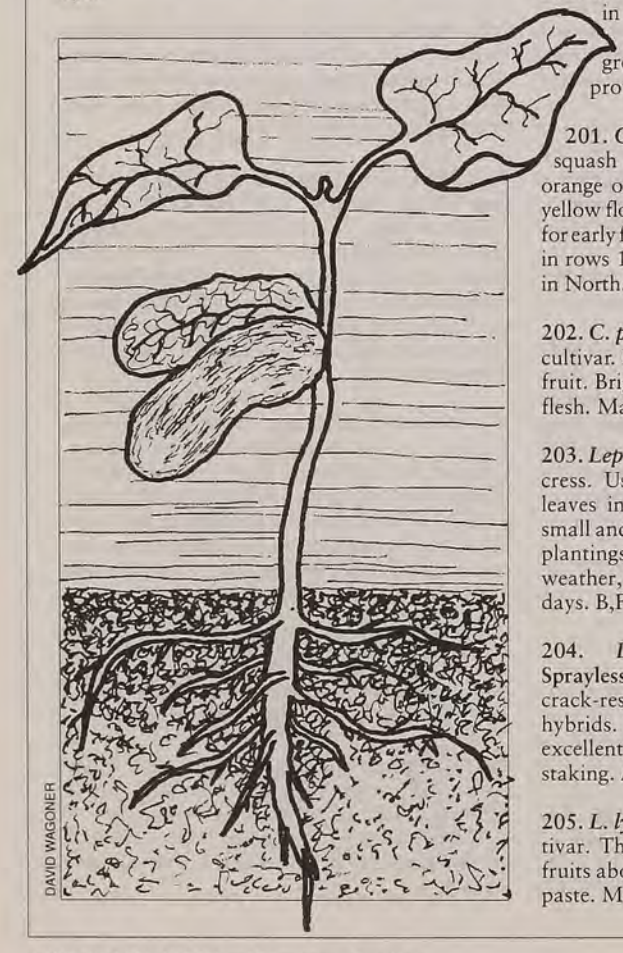
# Vegetables

192. *Brassica juncea* var. *crispifolia (B. japonica).* Chinese potherb mustard. Height: 1 foot. A very mild-tasting oriental green with elegant, feathery foliage. Fast-growing. Harvest young leaves or more mature heads. Will produce greens throughout growing season. B,H.

193. *B. oleracea.* Russian red kale. Height: to 3 feet. One of the rarer varieties. Frilly, wavy reddish purple-veined leaves. Plant late spring to summer. Excellent for an overwintering crop in the Pacific Northwest. Matures in 50 days. A,L,K.

194. *Capsicum annuum* **'Thai Hot'.** Pepper cultivar. Mound-shaped plants about 8 inches high. Extremely hot, 1-inch green and red peppers. Used in oriental cooking and as an ornamental. Great for edging, borders, or containers. Matures in 60-70 days. A.

195. *Chenopodium quinoa.* Multi-head quinoa. Height: 5-6 feet. Flowers in tail-like panicles of red, orange, yellow, purple, or mauve. Small, egg-shaped, dull blue-green leaves can be used as salad greens and the seed heads can be cooked or used as flour. Matures in 100 days. Detailed use and growing sheet will be enclosed with order. B,K.



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196. *Citrullus lanatus* **'Ice Cream'.** Watermelon cultivar. Produces 25-pound fruits with thin green rind, bright red flesh, and white seeds. A reliable heirloom. Matures in 75-90 days. A,B.

197. *Cucumis melo* **cultivar.** Honeydew melon. Donor unsure of cultivar. Produces 2-4 pound melons with smooth, greenish white rinds and light green or white delicate-tasting flesh. Start indoors in peat pots or sow outdoors 2 weeks after last frost and thin to 2-3 feet apart. In North, spread black plastic over soil to give plants a boost. A,B,L.

198. *C. melo* **cultivar.** Galia perfume melon. Honeydew-type fruit has green gold netted exterior. Melons may be up to 3 pounds. Cool summers might be beneficial. Matures in 85 days. A,B,H.

199. *C. sativus* **'Lemon'.** Cucumber cultivar. This old American favorite produces fast-growing, light yellow fruits that resemble lemons. The mild, crunchy cucumbers can be eaten raw or pickled. Harvest when young. Vine does best with a trellis support. Matures in 61 days. B,C.

200. *C. sativus* **'Russian Pickling'.** Cucumber cultivar. An excellent pickling cuke. Introduced in 1850. Fruits are 6 inches long and grow in clusters of 2 or 3. Will grow along ground, or in a container if trellising is provided. Matures in 52 days. A,B.

201. *Cucurbita maxima* **'Sweetmeat'.** Winter squash cultivar. A big squash with a pinkish orange or grayish rind. Heart-shaped leaves and yellow flowers on sprawling vines. Hand-pollinate for early fruit. After last frost direct sow 4 feet apart in rows 10-15 feet apart. Use black plastic mulch in North. Matures in 110 days. B,C,H.

202. *C. pepo* **'New England Sugar Pie'.** Pumpkin cultivar. Excellent for cooking. Small to medium fruit. Bright orange rind with rich, sweet orange flesh. Matures in 100 days. B.

203. *Lepidium sativum.* Garden cress, broadleaf cress. Use the pepper-flavored, sword-shaped leaves in salads or sandwiches while they are small and tender. Very fast-growing. Make small plantings every 3 weeks from spring until hot weather, then again in fall. Matures in 45-60 days. B,F.

204. *Lycopersicon lycopersicum* **'Peron Sprayless'.** Tomato cultivar. A disease- and crack-resistant tomato that outperforms many hybrids. Deep scarlet fruit is vitamin-rich and excellent eating. Ripens in midseason. Needs staking. A,B,H.

205. *L. lycopersicum* **'Yellow Bell'.** Tomato cultivar. This heirloom bears yellow, pear-shaped fruits about 3 inches long. A superior tomato for paste. Matures in 60 days. A,B,H.

206. *Phaseolus vulgaris* **'Blue Lake Express'.** Bush bean cultivar. A new disease-resistant, high-yielding bush bean that ripens extra early. Excellent fresh, frozen, or canned. Harvest pods while young and tender. Regular picking encourages more production. Matures in 44 days. B.

207. *P. vulgaris* **'Hutterite Soup'.** Bush bean cultivar. Plump, light green seeds. Grows to 16-24 inches. Can be made into a creamy white gourmet soup. Matures in 55 days. B,H.

208. *P. vulgaris* **'Ruth Bible'.** Pole bean cultivar. Heirloom grown by a Kentucky family since the 1830s. Vigorous grower yields 3½ inch brownish tan pods that are best if picked when young. Matures in 52 days. B,H.

209. *Zea mays* **'Hopi Blue'.** Corn cultivar. Height: 5 feet. This ancient corn cultivar was a staple of the Hopi Indians of northern Arizona. Bushy plant develops 7-inch ears with smooth blue kernels. Used for flour. Soak overnight before sowing. Matures in 90-100 days. B,H.

210. *Z. mays* **'Red Dent'.** Corn cultivar. Height: 9 feet. This corn is highly resistant to blight and drought. Ears average 9-12 inches. Should be eaten while the kernels are white; kernels turn red later in the season and become tough. Matures in 105 days. B,H.

211. *Z. mays* **'Tom Thumb'.** Popcorn cultivar. Height: 3½ feet. An heirloom dwarf popcorn with ears 3-4 inches long. Yields 2-4 ears per plant. Delicious. No hard centers in popped kernels. Matures in 85 days. B.

# Greenhouse

These plants can be grown in the greenhouse or outdoors in Zones 9 or 10.

212. *Annona cherimola.* Cherimoya. Height: 20 feet. Evergreen tree. Leaves are oval or lance-shaped, velvety beneath. Strongly aromatic, usually solitary flowers with nodding fragrant outer petals. Four-inch fruits have a custardlike flavor. Hand-pollinate for fruit. A.

213. *Argyroderma patens.* Height: 1 inch. Clump-forming, perennial succulent similar to living stones. Grayish silver leaves and tiny, ⅝-inch yellow to bronze flowers. Requires well-drained porous soil, maximum sunlight and winter temperatures of about 60 degrees. Sharply reduce watering in winter. A,L.

214. *Bauhinia variegata.* Orchid tree. Height: 20-40 feet. Scented ornamental with heart-shaped 6-inch leaves. Flowers are spadixlike, 1 inch long with 2-inch red to magenta or white petals. Minimal maintenance. A.

215. *Caesalpinia mexicana.* Height: 30 feet. Native to Mexico. Oblong pinnate leaves, 2½-inch-long yellow flowers. Soak seeds in warm water 24 hours before sowing. Sow direct in frost-free areas; elsewhere, container grow and bring into greenhouse in winter. Zone 10-11. A,B,T.

216. *Carica papaya.* Papaya. Height: to 25 feet. Generally branchless trunk carries palmate leaves 2 feet in diameter on 2-foot stalks. Fragrant yellow flowers with 1-inch petals form clumps, mainly on female plants. Melonlike oval fruit has a thick, yellowish orange skin when ripe. Zone 10. C,T.

217. *Cheiridopsis* spp. Donor unsure of species. Dwarf, clump-forming, tufted succulents native to southwest Africa. Leaves are of various sizes, which gives the plants a wild appearance. Leaves usually greenish white with dark green spots. Flowers are yellow, orange, white, or violet-red and ½-4 inches across. Needs maximum sun, with a porous, well-drained soil. Water only when soil becomes very dry. H.

218. *Delonix regia.* Royal poinciana. Height: 20-50 feet. A wild and rangy, brilliant parasol of flowers in May-June. Flowers are 5 inches across in bunches of intense scarlet or crimson; one petal is marked with white or yellow. Very fast growing. Zone 10b. Hot water soak. B,H.

## Save this catalog!

219. *Gymnocalycium* spp. Chin cactus. Donor unsure of species. Small, round cacti often sold as novelties in florist shops. Mostly grayish green stems with well-formed ribs and yellowish spines. Bell- or funnel-shaped greenish white or greenish yellow flowers. Some species vary in color. Among the easier cacti to grow. Full sun with porous well-drained soil. A.

220. *Heimia myrtifolia.* Height: 3 feet. Deciduous shrub with very slender branches and lance-shaped, 2-inch leaves. Small yellow flowers with prominent stamens and style bloom throughout summer. Benefits from occasional pruning of older branches. H.

221. *Lapidaria margaretae.* Karoo rose. Height: Under 2 inches. A succulent native to South Africa and similar in appearance to living stones. Thick, ½-inch-long leaves are white to reddish, flat on one side and rounded on the other. Flowers, up to 2 inches across, are golden yellow. They look like daisies, though their structure is very different. Requires full sun, low humidity, and extremely well-drained porous soil that is never too wet or cold. Likes a winter night temperature of 50-55 degrees with day temperatures 10 degrees warmer. Water very sparingly when soil dries out. A,H.

222. *Lithops optica.* Living stones. Height: Under 1 inch. Essentially a stemless succulent, forming stonelike clumps buried in sand with tips of leaves exposed. Various markings with transparent "windows." Solitary flowers appear in central split after 3-4 years. Likes gritty porous soil and a hot dry environment. After the first year, keep moist in the summer but do not water from early autumn to early spring. Give maximum illumination in winter. Hardy to Zone 8. A,G,H.

## How to Order

Although we have a considerable amount of many of the seeds listed, in some cases the seed is in short supply. To increase the chances that you will get what you want, fill out the order form on this page and mail it immediately. Whenever possible, we'll send your first choices, but please also list alternate selections that we can send in case we run out.

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The cut-off date for orders is May 1. The longer you delay in placing your order, the less likely it is that you will receive your first choices.

As you complete the order form, we hope you will consider making a donation to help defray the cost of the Seed Program. We suggest a minimum of $2 if you are ordering 10 packets of seed, and $3 if you are ordering 15 packets of seed. All contributions to the American Horticultural Society are tax-deductible.

## Seed Program 1994

One of the greatest rewards of gardening is the feeling you get when you've raised a plant in such abundance that you have enough seed, cuttings, or divisions to share with your friends. Start thinking now about sharing your 1993 bounty with AHS's nationwide community of gardeners. Although much of the seed in our catalog is donated by seed companies and botanical gardens, we also depend heavily on donations from members. Particularly if you have any unusual or rare plants in your garden, we hope you will collect the seed and send it to us for the 1994 seed offerings so that it can be shared with other American Horticultural Society members. For information on the 1994 Seed Program, write to:

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✦ List your selections by number only.

✦ Attach the mailing label from your copy of the News Edition or fill in your name, address, and member code number. **Your member number is located at the top left-hand corner of the mailing label on the back of this issue.** By including your member number we can provide you with prompt and efficient service. Please make any address corrections on the label.

✦ **Save your catalog to identify the seeds you have selected.**

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**Please send me the following "first preference" seed packets:**

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|---|---|---|---|
| 1. _____ | 5. _____ | 9. _____ | 13. _____ |
| 2. _____ | 6. _____ | 10 _____ | 14. _____ |
| 3. _____ | 7. _____ | 11. _____ | 15. _____ |
| 4. _____ | 8. _____ | 12. _____ | |

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| | | | |
|---|---|---|---|
| 16. _____ | 18. _____ | 20. _____ | 22. _____ |
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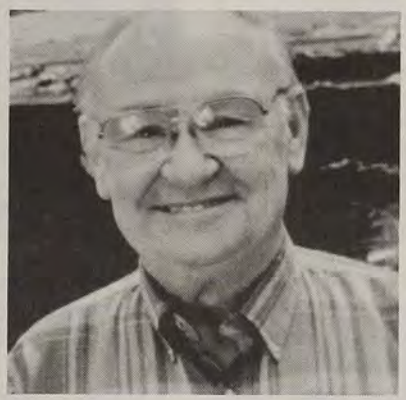
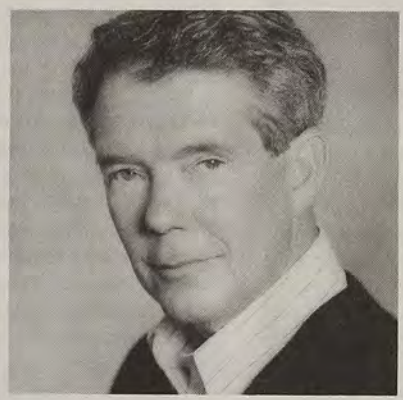
# Garden Sensibly.

*Katy Moss Warner, General Manager of Horticulture at Walt Disney World and AHS board member discusses the visual appeal of color.*

*Victory Garden Host Roger Swain offers "An Ear to the Ground: Listening to the Heartbeat of a Garden."*



*Robert Marvin, a South Carolina landscape architect, will speak on the visual elements of garden design.*



*Rayford Reddell, owner of Garden Valley Ranch in Petaluma, Calif., presents "Fragrance — Whose Nose Knows?"*

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# Gardeners' Bookshelf


## 550 Home Landscaping Ideas

*Catriona T. Erler and Derek Fell. Photographs by Derek Fell. Simon & Schuster, New York, 1991. 192 pages. 9½" × 11½". Color photographs. Publisher's price, hardcover: $30. AHS member price: $27.*

This book is just what it says it is: chock full of ideas for every sort of garden under the sun. Seven chapters cover international, regional, seasonal, plant-theme, and color-theme gardens, plus garden accents and habitat gardens. Window shop through these categories and you're sure to find some ideas that will work for you:

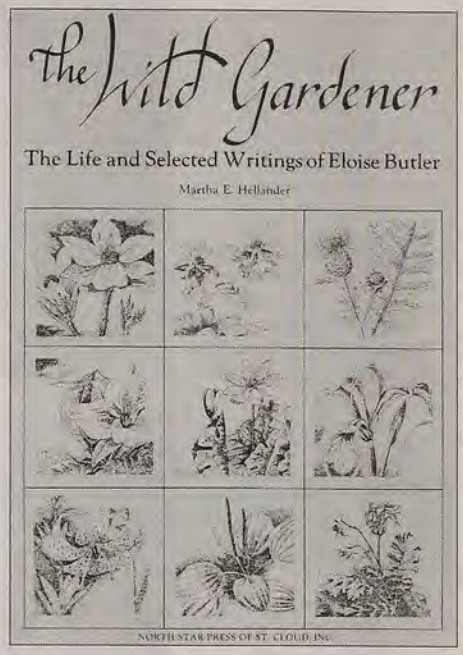
Perennials in smashing color combinations; Japanese green on green; two bronze statues of little girls in a pool; a wonderfully secret space enclosed by a tall hedge; overflowing urns and "portable color" in pots and tubs, and an incredible profusion of blooms spilling out of window boxes; romantic arbors of many designs dripping with roses or wisteria. You will find water, stone, grasses, autumn foliage, trees, and evergreens.

Derek Fell, coauthor with Catriona T. Erler, is internationally known for his garden photography and more than 30 garden books. Erler, a free-lance garden writer and lecturer, joins him in offering practical tips and design basics for the best use of space, color, water, ornamentation, and all-season planting, according to your geography and personal taste. —*Faith Jackson*

*Faith Jackson is the former book review editor of the* Miami Herald *and a Master Gardener.*

## The Wild Gardener

*Martha E. Hellander. North Star Press of St. Cloud, Inc., St. Cloud, Minnesota, 1992. 192 pages. 7⅜" × 10¼". Black-and-white illustrations and photographs. Publisher's price, softcover: $19.95. AHS member price: $17.95.*




Eloise Butler may not be a familiar name to those living outside Minneapolis, but her fascinating life as an amateur plant hunter and her work in establishing Minneapolis's Wild Botanic Garden (now the Eloise Butler Wildflower Garden and Bird Sanctuary) are certainly deserving of recognition beyond the boundaries of Minnesota. Luckily Martha E. Hellander has told her story in *The Wild Gardener.*

Butler, who was born in Maine in 1851, moved to Minneapolis in 1874 to accept a teaching position. Minneapolis had been settled 26 years earlier and was well on its way to becoming a leading lumber- and flour-milling city. Butler spent 37 years teaching in Minneapolis's schools (she also taught for several years in Maine and Indiana before moving to Minnesota), most of them at Central High, where she taught history and botany.

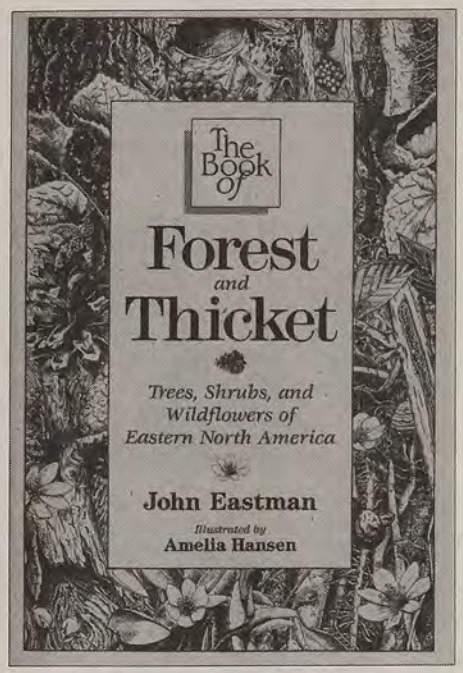
Throughout her teaching career, Butler searched the wild places of Minnesota and Maine for wildflowers. During the mid-19th century, devoted amateurs could still discover new plant species and Butler pursued the study of botany and plant collecting with a focused determination. In 1881 Butler began a decade-long fascination with desmids—tiny freshwater algae—and her collecting skills eventually yielded seven new species, including one that Francis Wolle—a Moravian minister who had published articles on freshwater algae in botanical journals since 1876—named for her, *Cosmarium eloiseanum.* Butler's success with the desmids led her on to plant-hunting expeditions in Jamaica, Nova Scotia, British Columbia, Maine, and Colorado.

In 1907 Butler and three other botany teachers prepared a petition requesting that the Minneapolis Park Board set aside a boggy area in Glenwood Park for a wild botanic garden. Their request was granted and on April 27, 1907, Butler wrote in her journal, "Opened today the 'Natural Botanical Garden' by planting two pitcher plants, which I had kept over winter." Butler became curator of the Minneapolis Wild Garden four years later at age 60. "She became one of those rare persons whose lives completely express their calling," Hellander writes. "Her life's work became the promotion of the appreciation and conservation of native plants through development of the garden." Butler held the curator position until her death at age 81 in 1933.

The first half of *The Wild Gardener* is devoted to the story of Butler's life. The second half includes selections of Butler's writing, including an article, "Botanizing in Jamaica," that she wrote in 1902 for *Postelsia,* a publication of the Minnesota Seaside Station at Vancouver; selections from a weekly column on Minnesota's native and naturalized plants written for the Sunday Minneapolis *Tribune* in 1911; an article, "Cultivation of Native Ornamental Plants," originally published in *Minnesota Horticulturist* in 1912; and a reprint of a two-volume selection of Butler's writings published by friends after her death—Butler had intended to use this material in a book, *Annals of a Wild Garden,* a chronicle of the natural history of the wildflower preserve.

Each chapter of *The Wild Gardener* contains detailed footnotes and the book includes a bibliography and an index. Hellander lived near the Eloise Butler Wildflower Garden and Bird Sanctuary for five years and she began researching Butler's life in 1988. The biographical sections are well-balanced with Butler's articles, making *The Wild Gardener* a piquant look at the life of the woman who "provided Minnesotans with a treasured wild place in the midst of vast urban expansion."

—*Mary Beth Wiesner, Assistant Editor*




## The Book of Forest and Thicket

*John Eastman. Illustrated by Amelia Hansen. Stackpole Books, Harrisburg, Pennsylvania, 1992. 212 pages. 5½" × 8¼". Black-and-white illustrations. Publisher's price, softcover: $14.95. AHS member price: $13.45.*

Field guides are wonderful resources for identifying wildflowers, or trees, or birds, or whatever your passion might be. But many plant field guides don't give much more than notes on leaf shape, color, height, bloom time, and habitat. Once you've identified the plant and learned the basics, you've fairly exhausted the field guide's use. Then it's time to open *The Book of Forest and Thicket.*

The first difference between this and more basic guides is that *The Book of Forest and Thicket* doesn't include the identification keys that characterize traditional field guides. And it isn't plant specific (although it is region specific to eastern North America). Where most guides focus on one plant group, John Eastman has combined trees, shrubs, and wildflowers into one book.

Another difference is that Eastman's guide focuses on the interdependence of life. Each entry includes information on pollination, insects and animals that feed on the plant, and other plants that may be found growing nearby. You'll also find folklore and historical uses of each plant and descriptions of seed dispersal and germination. Plant descriptions also are here, along with a list of close relatives.

In the pages of *The Book of Forest and Thicket* Eastman points out that the butternut's leaf scars look like the eyes and "happy-face smile" of a camel; the seeds of the fringed polygala contain an oily liquid favored by ants—the ants carry the seeds back to their nests, consume the oily appendages, and discard the seeds in heaps to create new beds of fringed polygalas; mayapple fruits can be used to make marmalade but all of its other plant parts are highly toxic; mountain laurels are "spring-loaded" and may throw pollen a foot or more without insect aid; the Chippewas used hepatica roots as charms to lure fur-bearing mammals to their traps; a tea made of trout lily leaves was thought to be a sure cure for hiccups; a fine artist's charcoal is made from hazelnut wood; the petals of blue violets act like litmus—the petals turn red when exposed to an acid solution and yellow in an alkaline solution.

While Eastman's book is filled with fascinating facts, it isn't intended to replace the trusty field guide. If you aren't familiar with a plant, you won't be able to identify it using *The Book of Forest and Thicket.* Not all of the plants are illustrated and Eastman provides only bare bones descriptions. But the book's only real drawback is that it's arranged in alphabetical order by common name. Eastman does provide botanical names and lists of other common names, but there isn't an index, so finding a particular plant may involve a bit of searching. —*M. B. W.*



## The National Wildflower Research Center's Wildflower Handbook

*Voyageur Press, Stillwater, Minnesota, 1992. 304 pages. 5⅞" × 9". Black-and-white illustrations. Publisher's price, softcover: $12.95. AHS member price: $11.65.*

This is the second edition of *The National Wildflower Research Center's Wildflower Handbook.* The book's subtitle, "A Resource for Native Plant Landscapes," says it all. Six chapters provide the basics of wildflower gardening: adding native plants to an existing garden; starting a wildflower meadow from scratch; guidelines for collecting seed; propagation techniques; buying wildflower seeds in bulk; and creating a garden that will attract butterflies, bees, insects, birds, and small mammals.

The bulk of the book is three chapters of lists (alphabetical by state). These are: conservation organizations and governmental agencies; native plant nurseries and seed companies; and landscape architects and designers who use native plants. Each entry includes an address and phone number and a brief description of the organization. Nursery and seed company lists include catalog price and the company's primary plant focus (trees and shrubs, herbaceous wildflowers, grass seed, wildflower seed, cacti and succulents). This is an excellent reference for both serious and beginning wildflower gardeners. —*M. B. W.*

# AHS Bulletin Board

## Penelope Hobhouse
Book Order Form
and Lecture Registration

***Gardening Through the Ages***

☐ AHS member price: $35
Quantity:_____

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**Lecture**

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7931 East Boulevard Drive,
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## AHS Sponsoring Penelope Hobhouse Book Tour Lecture

Members and friends of the American Horticultural Society are invited to attend a lecture and book-signing by British author and plantswoman Penelope Hobhouse from 10 a.m. to noon Friday, February 26 at the Lyceum, 201 South Washington Street in Alexandria, Virginia. Light refreshments will be served following her talk.

Hobhouse's lecture will focus on themes in her latest book, *Gardening Through the Ages,* subtitled "An Illustrated History of Plants and Their Influence on Garden Styles—From Ancient Egypt to the Present Day." The book is a far-reaching study of the way plants have been used throughout history and the many ways in which the plants available to gardeners in any given time in history influenced garden design. Hobhouse, a designer and authority on historic gardens, explores the interaction between plants and the people growing them, showing how our gardens mirror the ideas, tastes, and traditions of each period.

A beloved gardening author on both sides of the Atlantic, Hobhouse's previous books include *Color in Your Garden, Garden Style, Gardens of Europe,* and *Flower Gardens.* She is currently in charge of the National Trust Garden at Tintinhull, Somerset, England.


Her new book is lavishly illustrated with 400 photographs and other art—more than half in color—on its 320 pages. It will retail for $50 when it is released to the public in March. Members and friends of AHS may order the book at a discount now to be picked up and signed at the lecture.

AHS members may make reservations for the lecture at a reduced rate. Seating is limited and priority will be given to AHS members. The deadline for reservations and book orders is February 18. No tickets will be mailed. For more information call (703) 768-5700.

PHOTOS BY DAN WIDMER

*Left: Claude Hope, center, winner of AHS's Liberty Hyde Bailey Award, tours River Farm with other participants in the AHS Annual Meeting in Alexandria, Virginia, in October. Right: Lecturer and author Roger B. Swain, winner of this year's Horticultural Writing Award, autographs a book for a member.*

# Compost Symposium Planned

AHS Director of Programs Joseph M. Keyser is representing the Society in planning a National Compost Symposium to be held February 25-26. Tentatively set in Orlando, Florida, it is sponsored by the Environmental Protection Agency and the National Recycling Coalition.

The Novon Division of Warner Lambert is providing funding for the event, at which leaders of regulatory and environmental groups—such as the Environmental Protection Agency, the U.S. Department of Agriculture, the Environmental Defense Fund, the National Audubon Society, and the Rodale Institute—will work toward developing a national strategy on source-separated composting, including a look at horticultural and agricultural markets for composted materials.

Keyser's role on the symposium's steering committee is to address the consumer-related topics of source reduction through home and community composting and public education, in respect both to home composting and consumer and horticultural use of compost.

Those attending the symposium will represent a broad spectrum of government and regulatory agencies, compost facility operators, potential compost markets, technical and legislative experts, and other members of the solid waste management, environmental, horticultural, and legislative communities.

# Pen Pals Wanted

Did you ever wish you had a good friend in Britain that you could chat with about gardening? Someone you could pop in to visit for a spot of tea should you be in the neighborhood?

Here's your chance.

Alistair Ayres, editor of *Gardening From Which?*, a publication for garden product consumers in Britain, is setting up a Penpals Club for gardeners all over the world. "So far," he says, "we have received a marvelous response from our readers, many of whom expressed an interest in writing to gardeners in the USA."

Ayres wrote to Linda F. Golodner, president of the National Consumers League in Washington, D.C., who forwarded his letter to the American Horticultural Society.

Write: Alistair Ayres, Gardening From Which?, 2 Marylbone Road, London, NW 1 4DF, England.

# River Farm Art

Whether you're blue from the cold or post-holiday let-down, stave off the winter doldrums with a trip to one of our on-going series of outstanding art exhibits at River Farm.

**Francesca Anderson,** a botanical illustrator at the New York Botanical Garden, will display her pen-and-ink and colored pencil drawings January 6 to February 15. Anderson's work was included in the Seventh International Exhibition of Botanical Art and Illustration at the Hunt Institute in Pittsburgh.

**Dorothy Fall,** an artist from Washington, D.C., will exhibit her paintings and watercolors at River Farm February 17 to March 29. Fall's style is on a fine line between impressionism and abstract expressionism, the shapes of her subjects emerging mysteriously from masses of vibrant, whirling color.

Admission is free to both exhibits.

# Gardeners' Dateline

## Mid-Atlantic

✦ **Jan. 18-20. The 97th Annual Meeting and Trade Show of the Virginia State Horticultural Society.** Richmond, Virginia. Information: Clayton Griffin, Virginia State Horticultural Society, P.O. Box 718, Staunton, VA 24402, (703) 332-7790.

✦ **Jan. 26-27. Second Annual Virginia Flower and Garden Symposium.** Virginia Beach, Virginia. Information: Bonnie Appleton, (804) 363-3906.

✦ **Feb. 12-13. Virginia Herb Growers and Marketers Conference.** Boar's Head Inn, Charlottesville, Virginia. Information: Anne Vaughan, Virginia Herb Growers and Marketers Association, 200 East Hundred Road, Chester, VA 23831, (804) 530-1157.

✦ **Feb. 12, 14. Leaving No Stone Unturned VII.** Symposium. Rockville, Maryland. Information: Sandy Lerner, Environmental Design, P.O. Box 15121, Chevy Chase, MD 20825, (301) 495-4747.

✦ **Feb. 13-14. Association of Landscape Designers Annual Meeting.** Held in conjunction with "Leaving No Stone Unturned VII." Rockville, Maryland. Information: (301) 495-4747.

## North Central

✦ **Jan. 4-Mar. 28. Tropical Rainforests: A Disappearing Treasure.** Exhibit. Chicago Botanic Garden, Glencoe, Illinois. Information: Stan Zoller, (708) 835-8213.

✦ **Jan. 9-12. Grower Expo '93.** Rosemont, Illinois. Information: Julie A. Stewart, P.O. Box 532, Geneva, IL 60134-0532, (708) 208-9080, or Fax (708) 208-9350.

✦ **Jan. 15-17. The 33rd Annual Ohio Roadside Marketing Conference.** Dayton, Ohio. Information: (614) 292-6413.

✦ **Feb. 12-14. Fifth Annual Midwestern Herb Show.** Mount Vernon, Illinois. Information: Teresa Brookman, R.R. 1, Box 396, Opdyke, IL 62872, (618) 756-2271.

✦ **Feb. 23-26. The 24th Annual Conference of the International Erosion Control Association.** Indianapolis, Indiana. Information: IECA, P.O. Box 4904, Steamboat Springs, CO 80477-4904, (303) 879-3010, Fax (303) 879-8563.

## Northeast

✦ **Jan. 22-24. Garden Dreams.** Lecture series. Mohonk Mountain House, Lake Mohonk, New Paltz, New York. Information: Helen Dorsey, (914) 256-2163.

✦ **Jan. 23-Apr. 30. Welcome Spring.** Display. Longwood Gardens, Kennett Square, Pennsylvania. Information: (215) 388-6741.

✦ **Jan. 26. Landscape Ideas.** Seminar. Pittsburgh Civic Garden Center, Mellon Park, Pittsburgh, Pennsylvania. Information: (412) 441-4442.

✦ **Jan. 30-Feb. 7. Indoor Bonsai Exhibit.** Steinhardt Conservatory, Brooklyn Botanic Garden, Brooklyn, New York. Information: (718) 941-4044, Barbara Pesch, ext. 255 or Joanne Woodfin, ext. 215.

## Northwest

✦ **Mar. 6. Women in Horticulture Conference.** Bellevue, Washington. Sponsored by the Association for Women in Horticulture. Information: Terri Arnold, (206) 935-7951 or Deb Powers, (206) 524-1672.

## Southeast

✦ **Jan. 20-23. The 23rd Annual National Tropical Foliage Short Course.**

## 1993 Flower Shows

✦ **Jan. 12-24. St. Louis Flower Show.** "America Abloom—A Celebration of Regional Styles in American Gardening." St. Louis, Missouri. Information: (314) 997-3407.

✦ **February 11-15. Northwest Flower and Garden Show.** "Gardens of the World." Washington State Convention Center, Seattle, Washington. Information: Rosanne Cohn, (206) 455-2771, Fax (206) 455-9661.

✦ **Feb. 17-21. Atlanta Flower Show.** "At the Movies." Atlanta, Georgia. Information: Carol Flammer, (404) 876-5859.

✦ **Feb. 18-21. Fourth Annual Maymont Flower and Garden Show.** Maymont, Richmond, Virginia. Information: Emily Rusk, (804) 358-7166; Ken Storey, (804) 353-3212.

✦ **Feb. 20-23. Chelsea America Flower Show.** Palm Beach, Florida. Information: (407) 793-7577.

✦ **Feb. 20-23. Chelsea America Flower Show.** Rancho Palos Verdes, California. Information: (310) 648-6602.

✦ **Feb. 26-Mar. 7. New Jersey Flower and Garden Show.** Garden State Exhibit Center, Somerset, New Jersey. Information: (908) 560-9020.

✦ **Mar. 3-7. The 38th Annual Flower Show of the Garden Club of Toronto.** Toronto, Ontario, Canada. Information: Denise Howe, (416) 924-4496.

✦ **Mar. 6-14. New England Spring Flower Show.** "Through the Garden Gate." Bayside Exposition Center, Boston, Massachusetts. Information: Fran Imhoff or Susan Donovan, (617) 536-9280.

✦ **Mar. 7-14. Philadelphia Flower Show.** "Preserving the Past, Presenting the Future." Philadelphia Civic Center, Philadelphia, Pennsylvania. Information: (215) 625-8250.

✦ **Mar. 13-21. New York Flower Show.** "Gardens for Our Future." Pier 92, New York City, New York. Information: Dana Robbin, Horticultural Society of New York, 128 West 58th Street, New York, NY 10019, (212) 757-0915.

✦ **Mar. 17-21. Washington Flower and Garden Show.** Washington Convention Center, Washington, D.C. Information: TJS Productions, 7668B Fullerton Road, Springfield, VA 22153, (703) 569-7141.

COURTESY OF THE CLOISTER

*Increase your gardening expertise February 28 to March 4 at the Fourth Annual Cloister Garden Series, a week of workshops, lectures, garden tours, and recreation on Georgia's Sea Island. Highlights include a garden photography workshop with Tom Eltzroth, two flower arranging workshops with Pauline Runkle, and lectures from author Frederick McGourty and Dr. Richard Howard, former director of Harvard's Arnold Arboretum. AHS Director of Programs Joseph Keyser will give a March 1 lecture titled "Four-Alarm Composting." The garden photography workshop will be held prior to the series on February 27. For more information and registration write or call: Irene Butler, The Cloister, Sea Island, GA 31561, (800) 732-4752.*

Fort Lauderdale, Florida. Concurrent with the Tropical Plant Industry Exhibition. Information: Karen Pruitt, (407) 886-1036.

✦ **Feb. 9-13. National Arborist Association Annual Meeting and Conference.** St. Petersburg, Florida. Information: NAA, P.O. Box 1094, Amherst, NH 03031-1094, (800) 733-2622.

✦ **Feb. 19-21. Winter Conference of the North Carolina Herb Association.** Charlotte, North Carolina. Information: Dick Tippett, NCHA, Route 1, Box 65, Godwin, NC 28344, (919) 567-2705.

✦ **Feb. 20. Eighth Guilford Horticultural Society Symposium.** Greensboro, North Carolina. Information: Gay Smith, 3502 Madison Avenue, Greensboro, NC 27403, (919) 855-7450.

✦ **Feb. 20-21. Camellia Show.** Atlanta Botanical Garden, Atlanta, Georgia. Sponsored by the North Georgia Camellia Society. Information: Carol Flammer, (404) 876-5859.

✦ **Feb. 26-28. The 18th Annual African Violet Society of America Show.** Juried Show. Information: Cheryl Hukle, Route 9, Box 5, 5520 Wilkins Road, Tampa, FL 33610, (813) 626-6817.

✦ **Feb. 27. Herb and Heirloom Vegetable Workshops.** Information: Edna Lovelace Gaston, Duke Homestead State Historic Site, 2828 Duke Homestead Road, Durham, NC 27705, (919) 477-5498.

✦ **Feb. 27-Mar. 7. The 33rd Annual Southern Spring Show.** Charlotte, North Carolina. Information: (704) 376-6594, Fax (704) 376-6345.

✦ **Mar. 5-7. The 48th Miami International Orchid Show.** "Fiesta of Orchids/Fiesta de Orchideas." Miami, Florida. Information: South Florida Orchid Society, 6940 S.W. 111 Place, Miami, FL 33173, (305) 274-3741.

## West Coast

✦ **Jan. 2, Feb. 6. Plant Disease Clinic.** University of California Botanical Garden, University of California, Berkeley, California. Information: Bobby Ohs, (510) 642-3012.

✦ **Jan. 6. Fourth Annual Landscape and Nursery Expo '93.** "Great Ideas . . . Products-People!" Sacramento Convention Center, Sacramento, California. Information: Kenny Kakutani, (916) 442-4470, Fax (916) 442-4564.

✦ **Jan. 23-24. Bonsai Show.** Baiko-en Kenkyukai Bonsai Society. Los Angeles State and County Arboretum, Arcadia, California. Information: Char Wilson, (818) 821-3214.

✦ **Feb. 21-23. The 89th Annual Convention and Exposition of the United Fresh Fruit and Vegetable Association.** "The Fresh World." San Diego, California. Information: Beth Chase or Molly Machamer, (703) 836-3410.

✦ **Feb. 27-28. Camellia Show.** Descanso Gardens, La Canada Flintridge, California. Information: Char Wilson, (818) 821-3214.

## International

✦ **Jan. 14-17. North American Bramble Growers Association, Ontario Berry Growers Association, and International Ribes Association Joint Annual Conference.** Niagara Falls, Ontario, Canada. Information: Paul Otten, (612) 659-2515, Fax (612) 659-2464.

# Classifieds

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# A New Approach to Chestnut Blight

A team of genetic engineers is proposing a new solution to the blight that has sickened the American chestnut tree since the turn of the century.

Gil Choi and Donald Nuss of the Roche Institute of Molecular Biology in Nutley, New Jersey, have created a synthetic form of a virus that infects the Asian fungus and turns it into a benign form that will not kill the trees. They believe that once they introduce the virus into the wild, the benign fungi will exchange genetic material with its more damaging form, eventually rendering all of it harmless.

The naturally occurring form of the virus has failed to spread rapidly, but Choi and Nuss contend that the benign fungus will outcompete its dangerous relative. They plan to engineer the fungi in their lab, harvest its spores, and spray them on infected trees.

# White Rust Woes

In spite of years of wary vigilance on the part of U.S. growers and government officials, white rust has finally landed on American shores. An outbreak of the fungal disease has forced U. S. Department of Agriculture and California Department of Food andAgriculture officials to quarantine several commercial nurseries in California.

So far the disease has affected only the genus *Chrysanthemum*, according to Reg Rosander, officer in charge of the USDA's Plant Protection and Quarantine division in California. USDA agents first confirmed the presence of white rust in five commercial cutflower nurseries and one potted mum nursery in Santa Barbara County in December, 1991, and since then a spate of similar finds has caused the regulation of nurseries in Santa Clara, Santa Cruz, and Santa Barbara counties. The outbreak is particularly serious, he maintains, "because the disease is lying dormant much longer than plant pathologists originally thought." In fact, one mum population had been inspected and found rust-free 15 times from May to October, 1992, before the disease flared up. Humidity and temperature are thought to be the biggest factors in determining its tricky germination cycle.

Naturally, commercial growers are the most concerned about the rust situation. Andrew Bishop, plant protection manager for Yoder Brothers, Inc., one of the nation's leading stock mum producers, says American growers have been on the defensive against white rust for years, aware that it was a problem in Europe and South America.

# 1993 AAS Winners

All-America Selections has named two vegetables and two annuals as their winners for this year.

'Husky Gold' tomato is a deep golden orange that grows to only 36 to 40 inches tall and 28 inches or less in width, making it ideal for container growing. Its flavor is described as less tart than other yellow tomatoes. It matures 68 days after transplanting.

'Baby Bear' pumpkin is also a space saver, recommended as an ideal plant for children to plant or help grow. It has a Jack o' lantern shape but reaches only two pounds. Its vines spread 10 to 15 feet. The pumpkins, which are ready to harvest 120 days after the seeds are planted, can be used as decorations or pie filling. They are resistant to fusarium and gummy stem blight.

'Imagination' verbena offers a challenge to experienced gardeners. It has deep violet-blue flowers and a trailing habit that makes it attractive in a hanging basket. On the ground it will spread up to three feet. Heat and drought tolerant, it must be germinated in the dark and thus is difficult to start from seed. It will take 17 weeks to flower. However, the plants may be available in garden centers by spring.

Another heat lover is *Nierembergia* 'Mont Blanc'. This white-flowering annual, which gets five to six inches tall and spreads to about a foot, is comparable to an alyssum. Like the petunia, it is a member of the Solanaceae, and it can be started from seed in the same manner.

All-America Selections is a nonprofit organization, headquartered in Downers Grove, Illinois, which evaluates new seed-grown flowers and vegetables on the basis of their performance in gardens around the country.

# Special Genes Trigger Cold Tolerance

Researchers at the University of Wisconsin-Madison have found two sets of genes that help plants survive cold temperatures.

In studying potatoes, Jiwan Palta, a horticulturist in the university's College of Agricultural and Life Sciences, found one set of genes that was responsible for allowing the plant to tolerate frost before it had acclimated to cold temperatures, and another set that allowed it to acclimate to temperatures below freezing.

Wisconsin potato plants are unable to acclimate to cold temperatures and die at 28 degrees, but potatoes native to the Andes acclimate in 10 to 14 days, doubling or tripling their hardiness so that they can survive temperatures as low as 14 degrees.

Researchers in Palta's lab have found that a fat molecule, linoleic acid, increases as plants build up tolerance to freezing. They now believe that this increase in linoleic acid is a genetically important trait that could be transferred to frost-sensitive plants of many types to make them more cold tolerant.

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