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 Sanseveria 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.
American Horticultural Society

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

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Greenhouse Daydreams

You've been thinking about setting up a hobby greenhouse but you're not sure how painful an ordered 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 commit yourself to 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 barelimbed 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 $490 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: Considering 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 some degree the advantages conferred by the common wall, while permitting more room and light. A lean-to usually affords. 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 Polystachya? 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...
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 choose 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.

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.
Greenhouse Continued from page 3

(continued)

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.

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 slinged 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.

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.
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

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.

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 diffenbachia 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 tropica 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...
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 décor. 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. It’s more of a self-perpetuating system.

Some find that the terrarium’s appeal lies in the container and the plants secondary and surprising. 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.”

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 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 his readers 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 careful 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 279, 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.

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 Pendeleton 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.
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 is introducing predatory insects and biocontrols. 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
Rain Forest Under Glass

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'être 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, cassia, poinciana, Jacaranda, and markhamia; vines such as tropical bleeding heart, Duraehman'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 foxgloves and Philodendrons, and into a canyon ablaze with colorful orchids, bromeliads, and other epiphytes. Dominated by a woody bamboo forest, the mock Asia environ-

New architectural elements are drawing attention to an unusual international plant collection at the Sarah P. Duke Gardens' Asatic 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.

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 arborium 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 30 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 underlie these relationships." That collection now includes 513 species and cultivars, among them witch hazels, camellias, daylilies, bamboos, hol-lies, Japanese irises, rhododendrons and azaleas, deciduous magnolias, Japanese apricots, and various ornamental grasses.

At the dedication ceremony, special guest 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 an airtight container 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 variety, you can introduce more of those practices each year that 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 other 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 (Catanaunch), 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

Call AHS’s Gardeners’ Information Service with your gardening questions at (800) 777-7931 between 11 a.m. to 3 p.m. EST.
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. **Browallia spectabilis** ‘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.

4. **Celosia cristata**. 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.

5. **Calendula officinalis** ‘Pacific Beauty’. Height: 24-30 inches. Uniformly large day-blooming flowers have flatterish 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.


7. **Celosia argentea**. 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, white, 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 white daisy-like 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.


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 gravelly soil and is ideal for rock gardens or the front of borders or containers. Heat-tolerant. A,B,C,D,H.


19. **Gaillardia spp**. Blanket flower. Donor unsure of species. Height: to 2 feet. Double daisy-like 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 sp**. Hibiscus ‘Sunbeam’. Treasure flower. Height: 6-12 inches. Flowers red, yellow, orange, or pink on stems rising above foliage. Bases of 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.


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. Colors can be cut at full bloom to dry for bouquets. Thin to 18 inches apart. B.


25. *Papaver rhoesas*. 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.

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.

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29. *Papaver rhoesas*. 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.


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


35. *Tagetes erecta* ‘Sugar and Spice Mixed’. Marigold mix. Height: 20 inches. Easy to grow. Unbeatable ability 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 ¾ inches across on sturdy compact plants. A,B,H.


37. *Tagetes sp.* 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. Treated 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 trellising, over hanging walls, or as a trailing ground cover, hanging basket, or trellis. Does best with a support. Prefers warm sites. Slow germination. A,B,H.


40. *Verbena x hybrida*. Height: 12 inches. Leaves are grayish green. Flowers are clusters of pink, purple, red, or blue, 1-2 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.


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**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 x 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 acidic soil. This native is a good choice for shady borders and woodland gardens. Flowering will begin in its third year. Zone 3. B,E,F.


48. *Alyssum saxatile*. Star grass, unicorn root. Height: 1-3 feet. Tall racemes bearing white flowers up to 3 inches wide. Pointed leaves are 2 inches long. Not terribly showy, but makes a good choice for native plant gardens and semi-wild areas. Commonly found in acid soil, moist...

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 as collecting as possible. Transplant seedlings outdoors in spring. Zone 4-9. A,B.

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.


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.


70. D. grandiflorum 'Blue Butterfly'. Larkspur cultivar. Height: 1 to 3 feet. Half-inchwide, 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.


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.


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

Avoiding Damping Off

Damping off is a disease that can be a common problem in seedlings. 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 Phytophthora. 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. 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 (1/2 teaspoon per gallon water) to drench seed flat and soil medium before sowing.

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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. 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 3-10. A, B, H, K.


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 3 inches wide. Bell-shaped late summer flowers are violet-blue on 3-foot stems. Plant in shade. Zone 3. A, 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.


104. L. spicata ‘Alba’. Blazing-star cultivar. Height: 2½ feet. Similar to the previous entry but with 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, well-drained 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.


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.


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

114. *Malva alcea var. fistulata*. 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. *Mecanopsis 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-inch leaf blades. The leaves are ¾-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.

117. *Onothea eurybrosepala*. 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.


119. *Papaver orientale*. Oriental poppy. Height: 2-4 feet. Twelve-inch fernlike leaves. Showy 4-6 inch flowers have dark centers and orangeish 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. *Patricia lasiopetala* 'Rock Rose'. Rose mallow cultivar. Height: 3-4 feet. Many basal stems give shrubby form to this pink blooming perennial. Blooms present from late spring to frost. Adapted 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. To fall, 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.


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.


128. *R. hirta*. 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.


Save this catalog!

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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, 40 percent biennials, and 20 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 mixes.

**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 rain fall ample to keep your planting area moist. Seeds can be sown in early spring 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. 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 grass, globe candytuft, wallflower, California poppy, cape marigold (*Dimorphotheca sinuata*), annual baby’s-bread, sweet alyssum, California bluebell, dwarf larkspur, tidytips, yarrow (*Achillea millefolium*), globe candytuft, dwarf larkspur, corn poppy, and others.

141. **Low-growing Wildflower Mix.** A mixture of annuals, biennials, and perennials 6-16 inches high. A mix suited for walkways, driveways, or wherever low growth is desired. Included are globe candytuft, dwarf coneflower, wallflower, California poppy, cape marigold (*Dimorphotheca sinuata*), annual baby’s-bread, sweet alyssum, California bluebell, dwarf larkspur, tidytips, yarrow (*Achillea millefolium*), globe candytuft, dwarf larkspur, corn poppy, and others.

**Wildflower Mixtures**


**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 dispense them if you first mix the seed with three or four times its volume of fine horticultural vermiculite.
147. Abies balsamea. Balsam fir. Height: 45-75 feet. Conical to pyramidal shape spreading to 23 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 griseum. 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 leathery green on top, light green underneath. Full foliage is scarlet and yellow. Pinnacles of yellowish white fragrant 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.


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 thick 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.


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 1-inch wide oblong 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 from late April to May. Dark green foliage turns yellow, orange, and scarlet in fall. Rarely troubled by diseases or pests. Must have acid soil. Fall to part sun. Zone 4-8. N,Q.

158. Hibiscus syriacus. Rose of Sharon. Height: 8-12 feet. Street-tolerant tree with showy white, 3-inch long, pink-purple flowers late summer or full yellowish fall foliage. One of the best Hibiscus species for northern gardens, and very easy to grow. Makes a good hedge or screen. Fall 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 coated when ripe or be stratified and sown the following spring. Zone 4. A,B,R.


161. Lupinus arboreus. Tree lupine. Height: 3-8 feet. Ornamental shrub for mild climates. Short-stalked palamute 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 all 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 flowers that hang in terminal panicles 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.

T eed seeds frequently need extra treatment. In the wild, many will not germinate unless they have been subjected to a minimum amount of heat 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 warm before the cold stratification treatment are treated exactly as for cold stratification except 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.

T


166. Osmanthus heterophyllus. White, extremely fragrant autumn flowers. Height: 15-30 feet. Erect, narrow habit with upswung 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 rust-resistant long fruits. Seeds from 'Bradford' cultivar will differ from parents. Zone 6, A,B, Q.


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. Adapted to either boggy or dry soils. Seeds need no pretreatment. Zone 7-9, 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.


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


173. Pyrus calleryana. Callery pear. Height: to 20 feet. Large, upright, deciduous shrub or tree. Flowers are umbel-shaped and finely toothed and leaves are 8 inches long. Quadrangular black fruits attract birds. Tolerates urban conditions. Zone 7, Q, A.

174. Rhododendron maximum. Cascara buckthorn. Height: to 20 feet. Large, upright, deciduous shrub or tree. Flowers are umbel-shaped and finely toothed and leaves are 8 inches long. Quadrangular 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.

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 ¼-½ inch long. Cones are 1¼-3 inches long. Needs a deep, moist, 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, 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.


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


Save this catalog!
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.


Vegetables


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 care and growing sheet will be enclosed with order. B,K.


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

199. C. sativus 'Lemon'. Cucumber cultivar. This old American favorite produces last-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 coke. 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.


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 'Hutterer's Soup'. 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.

208. P. vulgaris 'Ruth Bible'. Pole bean cultivar. Heirloom grown by a Kentucky family since the 1830s. Vigorous grower yields 7-inch cans with smooth blue kernels. Used for flour. Soak overnight before sowing. Matures in 90-100 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: 34 feet. An heirloom 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.


213. Argyroderma patens. Height: 1 inch. Clump-forming, perennial succulent similar to living stones. Grayish silver leaves and tiny, 5-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. Serrate ornamental with heart-shaped 6-inch leaves. Flowers are spadix-like, 1 inch long with 2-inch red to magenta or white petals. Minimal maintenance. A.
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After sending in your order, it is important that you keep this catalog; you will need it to identify the seeds you receive. All the seed packets are marked with only the master list numbers that appear in this catalog.

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

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

Victory Garden Host

American Horticulturist • January 1993 • 11
**Gardeners’ Bookshelf**

**550 Home Landscaping Ideas**  
Catriona T. Erler and Derek Fell.  

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.

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**The Wild Gardener**  

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, “Open ed 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 National Wildflower Research Center's Wildflower Handbook

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.

The Book of Forest and Thicket

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 polygala; 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

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 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.
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 New York 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 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 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."

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


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.

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Helen F. Walutes, Acting Executive Director
American Horticultural Society
Gardeners’ Dateline

Mid-Atlantic


North Central


1993 Flower Shows


Northeast


Northwest


Southeast

• Jan. 20-23. The 23rd Annual National Tropical Foliage Short Course.
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 McCourty 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.

West Coast


† Jan. 6. Fourth Annual Landscape and Nursery Expo ’93, “Great Ideas...ProductstPeople!” Sacramento Convention Center, Sacramento, California. Information: Kenny Kakutani, (916) 442-4470, Fax (916) 442-4564.


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THE ORCHID GENUS BOOK by Patry Webster, 1992. Every serious orchidist needs this study guide, arranged by classification, with concise discussion of most popular species, major taxonomic changes, geographic distribution and unique characteristics. Features comprehensive bibliography for each of the 860 genera in the orchid family, drawn from 155 horticultural and scientific references. $34, or send SASE for more details, to ORCHID EDUCATIONAL SERVICES, P.O. Box 78701, San Antonio, TX 78278.

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American Horticultural Society • January 1993 • 19
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 fungus will exchange genetic material with its more damaging form, eventually rendering all of it harmless.

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 and Agriculture 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.

White Rust Woes

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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.