SEED CATALOG!
ANNUAL MEETING
FLOWER SHOWS
Our Last News Edition

This issue of our News Edition is special for a number of reasons. We’re always excited to bring you our annual Seed Catalog, and this year we kept pace with last year’s record-breaking number of offerings. You can choose from among 405 types of seeds, and we’re sure you’ll find plenty to tempt you, whether you’re interested in heirloom vegetables, Pelargonium species, or rare trees.

Also included in this issue is the program for our Annual Meeting, to be held this year in St. Louis, and a preliminary list of flower shows around the country that will offer free admission to members of the American Horticultural Society in 1996.

It is also the last News Edition to be mailed as a separate publication. You’ll receive the February American Horticulturist as usual, and in April, you’ll be receiving a redesigned, 64-page magazine, The American Gardener, that will encompass features of both our magazine and News Edition. We tried to incorporate many of the ideas that readers expressed in our last reader survey, including the most frequent comment: “Don’t change a thing.” We hope you’ll recognize your old friend in spite of the bigger size, added color, more readable format, and new name.
Rx for Chipmunks

In regard to the November letter from Boris Rubinstein of Long Island and his problems with chipmunks in his brick-in-sand terrace, here is a low-cost solution guaranteed to succeed.

He will need to remove enough bricks to excavate an area about four to six inches deep and two feet out in all directions from the entry hole of the chipmunks. Unlike groundhogs, who always dig multiple entry holes for their burrows, chipmunks rarely use more than one entry. Gardeners with any plantings in such an area should dig them up but not discard them.

Buy a piece of hardware cloth four by four feet and lay it into the excavated area with its center directly over the main entrance hole of the chipmunks. Hardware cloth is galvanized wire mesh, usually with half-inch-square openings—too small for chipmunks to penetrate. Bury the hardware cloth in the excavated hole and replace the bricks, or replant any perennials above the hardware cloth; if necessary, you may cut a hole six to eight inches in diameter to accommodate the plantings.

The chipmunks will be astonished to find that they can no longer dig a burrow at the same site, or even near, where they could once easily do so. When they relocate, it would be unusual for them to try to take up housekeeping near their old burrow.

These mischievous animals are so entertaining that I would probably prefer to allow them to reside under the terrace, trading the inconvenience of the burrow's location for the enjoyment I'd gain watching them forage and keep house next to my recliner as I sip lemonade in the summer sun. Mr. Rubinstein's experience should lay to rest the notion that chipmunks are shy creatures that will not live next to a house—utter bunk!

David L. Newcomer, M.D.
East Petersburg, Pennsylvania

A Second Opinion

Boris Rubinstein should try putting a metal (perforated) or masonry skirt with drain holes around the perimeter of his terrace. The depth would depend on soil conditions, but of course it would have to go deeper than the "critters" would burrow.

Esdin Glenn Troutman, M.D.
Fort Worth, Texas

Veterinary Medicine

In answer to Mr. Rubinstein's problem of chipmunks on the terrace—acquire a cat. I was overcome by chipmunks at my previous house until a neighbor's cat encamped by their holes. In my present rural home, I have two cats on patrol and no problems (except deer!).

Tessa McDonald
Hope, New Jersey

Deer-Preventive Medicine

At my home near a park in Montgomery County, Maryland, deer are regular and hungry visitors to our garden. For the first few years we lived here, I tried the home remedies of human hair, moth balls, and artificial fragrances in the hope of discouraging the deer from eating my tulips, roses, viburnums, and garden vegetables. For aesthetic and financial reasons, I did not wish to build a stockade fence, so I found myself feeding these handsome creatures.

At last, I tried to make a garden out of plants that deer won't touch. Searching for those poisonous to mammals gave me a fair beginning, but hardly enough to make a fine garden. I offer my list in the hope that it will provoke additional suggestions from other readers.

Deer-proof so far: alliums, bleeding hearts, Buddleia, Cimicifuga, crocuses, columbines, daffodils, foxgloves, lavender, mints, scilla. Others that they left alone for significant periods of time: Artemisia 'Silver King', Astilbe, birch, grape hyacinths, iris, nasturtiums, violets, wax begonias.

Please rush! Montgomery County is beginning to have public meetings about the depredations of these animals.

Sharon Palmer-Kroyston
Potomac, Maryland
Snow Creek
Daylily Gardens

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Pungent Cure
Like Boris Rubinstein, I have chipmunks and a brick patio. Fortunately, I also have many stone walls and the chipmunks prefer to live there.

I have, however, had a population explosion of rabbits in recent years. These rabbits prefer to eat all the tender new growth of woodland plants I am trying to establish.

At the Philadelphia Flower Show last year I purchased my first bottle of fox urine and have found it to be the only effective deterrent. The drawbacks are an extremely pungent odor and the expense. I find a few drops go a long way. The urine must be applied after each rain, but I feel the rabbits learn to avoid treated areas at least until next year.

Mary Liz Lewis
Summit, New Jersey

Fox urine is distributed by Johnson & Company, P.O. Box 2009, Bangor, ME 04402. It sells for $8.99 for eight ounces, $29.99 per quart, and $99.99 per gallon, plus postage. Johnson also sells, for $2.99 per half-dozen, foam “darts” that are supposed to wick the urine scent into the air. You can order by calling (800) 218-1749.

They recommend this product for deterring rabbits, squirrels, and chipmunks.

For deterring deer, the company offers coyote urine, and for mice and moles, bobcat urine. Its president, Ken Johnson, kindly sent us a sample of coyote urine. We passed it along to Aubrey Glass, grounds supervisor at the American Horticultural Society's River Farm headquarters, who has had deer tramping through his private garden. If it finds it effective, we'll report back.

We couldn't resist asking Johnson the obvious question: How do they collect this ... product? "It's a piece of cake," he says, "once you teach them how to use those little bottles."

Help Us Celebrate!
In 1997, the American Horticultural Society will celebrate its 75th anniversary. In honor of the event, we will be recognizing America's 75 best gardening books, 75 best plants, and 75 best gardening events. We want our members' input! The deadline for event nominations is January 1 (you can fax us at (703) 768-7533, or e-mail us at garden@ahs.org); the deadline for nominations in the other categories is March 1. You can nominate as many as you like in each category. See the November 1995 News Edition for details.

The Cloister Garden Series
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GARDENERS’ INFORMATION SERVICE

Q: What is the origin of the common name of dead nettles?
-R.S., Niagara Falls, Ontario

A: Dead nettles (Lamium album) are not members of the nettle family (Urticaceae) but of the mint family (Lamiaceae). The word “nettle” usually refers to a group of plants whose toothed leaves are covered with hairs that secrete histamine, which causes a stinging or burning sensation when it comes in contact with skin. Mint family members have aromatic foliage, two-lipped flowers, and square stems. What the two families have in common is that many members of both have a history of medicinal and culinary uses.

In The History and Folklore of North American Wildflowers, author Timothy Coffey explains that L. album is called dead nettle because its foliage resembles that of stinging nettle (Urtica dioica), but lacks the stinging hairs. Other common names for L. album have included bee nettle, blind nettle, day nettle, deaf nettle, dog nettle, dumb nettle, snake flower, suck bottle, and white archangel.

Q: I got a very nice balled-and-burlapped yellowwood on sale at a local nursery this fall. The man who dug it up wrapped the tree with plastic may cause damage to the roots. Who is right?
-K.E., Dawson Springs, Kentucky

A: A wire basket supports the root ball of field-grown nursery stock and allows it to be lifted without undue stress to the trunk. According to the September/October newsletter of the Virginia Nurserymen’s Association, it can take as long as 20 years for the wire to decompose. But a recent study by Edward Gilman of the University of Florida indicated that the spacing of wire in the basket allows ample room for roots to expand. He examined trees planted 12 years ago and found no evidence that the wire was affecting the root system. But Nina Bassuk, program leader of Cornell University’s Urban Horticulture Institute, says a basket could interfere with a tree’s buttress roots—those large roots that flare out from a tree’s trunk. She recommends removing the top one-third of the basket with wire cutters once the newly planted tree is in place and stable. You might still be able to remove enough soil to perform this operation.

Q: I recently purchased a five-foot-tall southern magnolia. I live in central Illinois (USDA Zone 5) and have planted the tree in a southern exposure. I understand that the first winter will be important to the survival of the tree. I mulched it heavily around the first of December and plan to cover it with heavy-gauge clear plastic before the temperature drops below 10 degrees. Can you make any other suggestions?
-J.M., via Internet

A: For overwintering newly established trees, we suggest special attention to two factors: water and protection from drying winds. Most plants need moisture even in the coldest winter. In fact, extremely cold weather can stress plants by locking up all available moisture in snow and ice. The mulch will help, but don’t let it pile up around the trunk and water the tree if your area has a long dry period.

Wrapping the tree with plastic may cause a heat build-up that will burn and dry the plant’s leaves, and using clear plastic in your southern exposure could increase the possibility of sunscald. You are right in trying to protect the tree from wind, and it should also be protected from snowload.

Four years ago Joseph W. Hickman of Benton, Illinois, at the northern edge of USDA Zone 6, formed the Hardy Magnolia Grandiflora Society with some like-minded individuals. Hickman tells us he has access to fiberglass tubing, three feet in diameter, that is used to conduct fresh and exhaust air in coal mines. He cuts these into three- and four-foot lengths that he slips over his trees for the first few years. “Any sort of structure of wire and burlap and/or plastic would serve the same purpose,” he says. “We have a feeling that if we can get a trunk the size of a quarter that the tree has a better chance of surviving severe winters.”

You don’t say if you have a named cultivar. Some, such as ‘Edith Bogue’, are known for their cold hardiness. Hickman and others in his group are propagating selections of M. grandiflora and testing their cold hardiness. Others that you may find in the trade, should your first effort fail, include ‘Charles Dickens’, ‘Majestic Beauty’, ‘Timeless Beauty’, ‘Simpson’, and ‘Victoria’. “It is expected that we will continue to find M. grandiflora trees of merit, which will aid us in moving this tree north of its natural habitat,” he says. “We hope that you will encourage your readers to write to me if they know of trees flourishing north of the Mason-Dixon line.” Write Joseph W. Hickman, 1407 North DuQuoin Road, P.O. Box 396, Benton, IL 62812-0396.

Q: My planting of hyacinth beans was a smashing success. The vines were covered with magenta flowers, and I had an abundance of purple pods still clinging to the vines well into the fall. Are the beans edible?
-F.S., Hickory, North Carolina

A: In North America the hyacinth bean (Dolichos lablab, syn. Lablab purpureus), also known as lablab bean and bonavist bean, is grown primarily as an annual ornamental vine because it is only reliably hardy south of Zone 9. It normally grows about 10 feet tall, but can reach 30.

In the tropics, however, it is widely cultivated for its edible pods and seeds. American Horticultural Society member Fran Bull uses the pods—picked when still under two inches long—to add color to salads. The beans inside, however, can be too strong for American palates. It is recommended that they be cooked in two or more changes of water.

—Neil Pelletier, Director
Gardeners’ Information Service

—End
MAIL-ORDER EXPLORER

Short-Season Specialists

For 14 years, Garden City Seeds, a small cooperative seed company based in Hamilton, Montana, has catered to a loyal following of vegetable gardeners in areas with short growing seasons. The company got its start as a fundraising venture for a nonprofit educational organization called the Down Home Project, selling repackaged seeds purchased from larger companies. But over the years the company has evolved into a regional source for heirloom and open-pollinated vegetable varieties, some of which are trialed and grown in the company's own organically farmed fields.

In November 1994, John Schneeberger and his wife, Karen Coombs, who had been involved with Garden City since its inception in 1982, purchased the company from the Down Home Project. They made Garden City a for-profit company and hired John Navazio, who had recently finished his doctorate in plant breeding at the University of Wisconsin, to direct an ambitious breeding program. Navazio's goal is to develop a line of vegetables that will retain the flavor and nutritional value of heirloom vegetables while incorporating vigor, disease resistance, and other desirable qualities associated with hybrids.

Navazio brings to Garden City both an extensive knowledge of classical breeding techniques and practical experience. As a truck farmer in Maine in the 1980s, Navazio realized "what a chasm there was between the type of seeds available to large-scale vegetable growers and what was needed by small-scale specialty growers and homeowners. Large seed companies were breeding vegetables with processing and long-distance trucking in mind," he says, "rather than for characteristics like flavor and texture." He decided no one was working in the middle ground between heirloom varieties and hybrids and went to graduate school "determined to do what it appeared no one else was doing."

Chris Blanchard, garden manager for the Heritage Farm headquarters of Seed Savers Exchange, the Decorah, Iowa, company founded by Kent Whealy to preserve genetic diversity in vegetables, calls Navazio "fairly unusual in that he's a generalist in a field where people are known for their specialties. He also came up through the plant breeding ranks in a way very few people have, which I think will really make a small company like Garden City work."

Henry Munger, professor emeritus of plant breeding at Cornell University in Ithaca, New York, says Navazio is working with germplasm from Cornell's program, including a winter squash with high vitamin content and exceptionally good texture and flavor. Munger says larger seed companies looked at the squash, but decided it didn't merit attention because "it doesn't look any different" from other winter squash. "I think there is a real place for a company like this—I think they perform a valuable service that other companies don't," says Munger.

Named 'Jade A,' the squash will be listed in Garden City's 1996 catalog.

Another new offering for 1996 is a carrot called 'Dragon' that is purple with an orange core. Erik Sorensen, an agent with the Washington State University Cooperative Extension Service in Pasco who conducts yearly trials of carrot varieties, says the carrot—derived from an Asian selection called 'Ping Ding'—has performed well in taste tests.

Because Navazio has only been working with Garden City for a little over a year, his first selections weren't available until this year. But regular customers rave about the heirloom mainstays and organic gardening products that have been offered all along. LeAnn Zodrow, a part-time switchboard operator in Princeton, Wisconsin, was impressed by the way the vegetables withstood a hotter-than-normal summer last year. "The heirloom plants stood up against the heat a lot better than the traditional varieties and hybrids," she says. Among the successes for Zodrow have been 'Jacob's Cattle' dry bush beans, 'Scarlet Emperor' runner beans, Thompson broccoli, and Brunswick cabbage.

Marilyn McIntyre, who lives at an elevation of 3,000 feet in Grouse Creek, Idaho, has been buying seeds from Garden City for about eight years. "For me, their seeds are as closely acclimated as they can be," she says. "I really like the 'Red Russian' kale, and I've had great luck with tomatillos, which can handle the cool weather at the beginning of the growing season."

Destine Hoover of Cheyenne, Wyoming, a 16-year-old who last year won an outstanding gardener award from Stokes Seed Company, has been growing vegetables for market for three years in a 4,000-square-foot, hand-dug garden. Of Garden City she says: "Their seeds are acclimated to conditions here, where it can be minus 30 degrees in winter and we can get hailstorms in summer. " Hoover especially likes a dark green summer squash called 'Zapalitto del Tronko' that has golden flesh with a texture that resembles avocado, and 'Chioggia' beet, which has red and white alternating rings within a scarlet skin.

—David J. Ellis
Assistant Editor

To receive a Garden City Seeds catalog, send $1 to Garden City Seeds, 778 Highway 93 North, Hamilton, MT 59840.
1996 SEED CATALOG

The descriptions in this catalog have a few assumptions in common. Unless otherwise stated, plants grown from these seeds will do best in well-aerated soil with full sun. Seeds should be covered unless the contrary is indicated. The best temperature for warm conditionning is about 70 degrees; cold conditioning should be done at 40 degrees. “Warm soil” is that with a temperature of at least 70 degrees. USDA zone numbers tend to be conservative; plants may grow outside the ranges specified.

1. Abélmoschus moschatus. Musk mallow, tropic jewel hibiscus. Height: 18 inches. A densely mounded plant with 3-to-5-inch fingerlike lobed leaves and 3-to-4-inch scarlet flowers with white centers. Blooms midsummer to frost. Performs well in hot summers. Seeds germinate best at 75-80 degrees, so start indoors or wait until soil temperatures are above 70 degrees.

2. Amaranthus caudatus. Love-lies-bleeding, tassel flower. Height: 3-5 feet. Vivid red tassellike flowers last for weeks. The young leaves and seeds are edible. Sow on surface of warm soil.

3. A. cruentus. Purple amaranth. Donor says it’s a Rodale multiflora. Height: to 5 feet. Features spiky green to maroon flowers drooping from terminal panicule. Used by Native Americans as a food plant. Can be grown like corn, but temperatures are above 70 degrees. Add to a warm soil mix. See A. caudatus, above.

4. A. hybrius var. erythrostathecus. Prince’s feather. Height: 5 feet. Thick stalks bear narrow, foot-long leaves and upright flowers spikes in midsummer. Both flowers and foliage are red. For culture, see A. caudatus, above.


8. Calendula officinalis. Pot marigold, calendula. Height: 1-2 feet. This Mediterranean native has thick, oblong leaves and solitary, showy, pale yellow to orange flowers up to 4 inches across. Blooms profusely from May to September, but can lag during hot summers. Dried flower heads were once used medicinally and to flavor soups and stews.


10. Celosia cristata. Cockcomb. Mixture of ‘Flamingo Feather’ and ‘Pink Candle’ cultivars. Height: 2-3 feet. Mixture of plume-type cockcomb cultivars includes lavender to pink and bi-colored flowers that bloom for up to 8 weeks in midsummer. Makes ideal cut flowers and everlasting. Tolerates drought. Keep temperature above 70 degrees during germination and don’t transplant or sow outside until temperatures are above 60 degrees.

11. Cleome spinosa. Spider flower. Height: 4 feet. Produces off-white flowers with “spidery” stamens and seed pods. Compound leaves have spines at the base. In hot sunny weather the petals will curl during the day and open fully in the evening. Grows well in sun or part shade and prefers dry soil. Do not cover seeds.

12. C. spinosa ‘Violet Queen’. Spider flower. Height: 4 feet. Violet flowers are 5-6 inches across.

13. Cleome spp. Spider flower species. Height: 3-5 feet. Donor unsure of species. Flowers are white, pink, and purple. For culture, see C. spinosa.


17. C. regalis ‘Blue Cloud’. Larkspur. Height: 3-4 feet. Resembles baby’s-belly, with a bushy clump of half-inch pale blue flowers. For cultural information, see C. ambigua.


21. Datura inoxia. Downy thorn-apple, angel’s trumpeter. Height: 3 feet. Huge, dark leaves on sprawling stems. White, sometimes pinkish trumpet-shaped flowers up to 8 inches long are fragrant and open at night. Pinching off spent flowers prolongs the blooming season, but spiky seed pods add late season interest. Caution: All parts of plant are poisonous. Sow indoors in late winter and transplant outdoors after last frost, or sow outdoors in warm soil.

22. D. meteloides. Angel’s trumpeter. Height: 2-4 feet. A lush, exonic, sprawling plant with large dark green leaves. Intensely fragrant 6- to 8-inch-long trumpet-shaped white flowers open in early evening, blooming midsummer to frost. Seeds of D. metel and subspecies of D. inoxia are often labeled under this name. True D. metelodises flowers are flushed with lavender. Caution: All parts of plant are poisonous. For culture, see D. inoxia.


red flowers are tipped with yellow. Oblong, gently toothed or serrated leaves. Descended from wild plants native to the American West. Drought resistant. Germinates in 2-3 weeks under light at 70 degrees.


27. Helianthus annuus ‘Aztec Gold’. Sunflower hybrid. Height: to 6-1/2 feet. Large, daisy-like flowers are 3-4 inches across yield plump, edible sunflower seeds for snacks or bird food. Grow in the north or west side of the garden to avoid shading lower-growing plants. Sow seeds outdoors after danger of frost has passed. Limited quantity available.


30. 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. Full sun or light shade. Biennial but will reseed.

31. L. annua ‘Variegata’. Money plant cultivar. Height: 2-3 feet. Similar to species, but has pink flowers and variegated leaves with creamy white margins.

32. Lupinus decaisnieri. Golly lupine. Height: to 3 feet. Bushy with palmate leaves and erect racemes of yellow flowers. Tolerates part sun; likes cool, moist conditions. Soak seeds overnight in warm water or scarify them.

33. L. hartwegii. Lupine. Height: 2-4 feet. Spike-shaped flowers are yellow, blue, white, or pink. Sometimes pink flowers bloom in summer. Needs part to moderate shade and moist, well-aerated soil.


35. Mirabilis jalapa. Four-o’clock. Height: to 3 feet. Fast-growing, bushy with pointed leaves resembling munt. Covered in summer with fragrant, tubular flowers in white, red, yellow, and pink. Some are striped. Tolerates some shade and is not particular about soil. Sow in warm soil. Will self-sow in warm areas. Its tubers can be dug in early fall and overwintered.

36. Nicandra physalodes. Shoo-fly plant. Height: 3 feet. A loose mass of large oval leaves and violet-blue, 1-inch flowers in July and August. Fruits resemble those of the Chinese lantern and are useful for arrangements. Sap is said to be insecticidal.

37. Nicotiana sylvestris. Tobacco flower. Height: 5 feet. A bold, basal rosette of bright green leaves up to 2 feet long, from which arises a thick stalk, topped in midsummer by a clump of long, tubular, fragrant white flowers. Tolerates some shade. South of Zone 7, may be grown as a tender perennial or biennial. Do not cover seeds.

38. N. sylvestris ‘Sensation Mixed’. Tobacco flower cultivar. Height: 4–5 feet. Similar to the species but flowering in purple, pink, and white.


41. Nolana paradoxa. Chilean bolfflower. Height: 3–8 feet. White, blue, or pink flowers are blotched with crimson petals. Blooms all winter. Germinates in 7 to 14 days.


44. P. somniferum. Opium poppy. Height: 1-4 feet. Pink double flowers bloom in summer above 3 to 5-inch serrated leaves. Tolerates part sun. Sow indoors in early spring after dry storage for 3 months at 70 degrees, transplanting before taproot forms, or sow directly in ground before last frost.

45. P. somniferum. Opium poppy. Height: 2 feet. Donor calls this selection ‘Queen’s Poppy’ and says it is derived from an English cottage hybrid. Height: 1-4 feet. Bears pink or white flowers. Has sprawling stems and kidney-shaped, apple-scented foliage. Flowers are white. Plant used as a source of opium poppy.

46. P. x papaver hybrid. Poppy. Donor unsure of species. Height: to 3/2 feet. Multiple ruffled magenta blooms attract bees. Birds like edible seeds, which can also be used for cooking.

47. Papaver spp. Poppy. Mixture of poppy varieties in various colors. Sow outside in cold soil after danger of frost has passed.


49. Pelargonium alcemiloides. Geranium species. Height: 1 1/2 feet. A slender, erect plant with pubescent, deeply lobed, and serrated leaves zoned with red. Flowers are white with rose-colored veins. Prefers shade. Scarify seeds before sowing outdoors after danger of frost has passed.

50. P. alternans. Geranium species. Height: 1 foot. Shrubby, low-growing plant has white flowers with streaked of red on upper petals.

51. P. australis. Geranium species. Height: 1 foot. Softly hairy geranium with faintly scented, rounded, shallowly lobed leaves and white, red, or rose-splotched flowers, sometimes with pink venation.

52. P. elongatum. Geranium species. Height: to 1 foot. Has bright green foliage highlighted by purple zones and bears white-to-cream-colored flowers all summer. Low-spreading plant that is short-lived and produces lots of seeds. Germinate indoors in early spring or sow directly outdoors.


54. P. hortorum ‘Glamour Rose Pink’. Zonal geranium. Height: 12–15 inches. Characteristics and growth requirements similar to ‘Camel’, but flowers are deep rose pink with a white eye.


SAVE THIS CATALOG!
**Gu ilde s to G ermination**

For those who want to learn more about collecting and germinating seeds, here is a list of references we have found useful in preparing the seed catalog. These books are available at a discount through the AHS book program. For further information, contact Barbara Catherwood at (800) 777-7931.


If you plan to germinate a lot of different seeds, it would be worth your while to get a copy of a book we have listed for the last two years—Norman C. Deno's *Seed Germination Theory and Practice*. Deno, emeritus professor of chemistry at Pennsylvania State University, self-published this handbook, in which he reports the results of his exhaustive experiments germinating seeds from about 2,500 different plant species. To get a copy, send $20, payable to Norman C. Deno, to 139 Lenor Drive, State College, PA 16801.

**Perennials**

- **Abelmoschus manihot**. Sunset hibiscus. Height: 3-6 feet. Tender perennial grown as an annual in temperate regions. Large ruffled yellow flowers with purplish center bloom in late summer. Easy to germinate. Zone 7-10.

- **Achillea filipendulina 'Coronation Gold'**, Fernleaf yarrow. Height: 3 feet. Long-growing yarrow with small, flat, dense heads of yellow flowers from late spring to midsummer. Flower heads retain color for dried arrangements if cut before pollen development. Heat-tolerant plant that prefers dry soil and full sun. Zone 4-8.

- **Agalinis tenuifolia**. Common yarrow variety. Height: 2-3 feet. Flat heads of deep pink flowers that fade to cream bloom above feathery dark green leaves. Zone 3-10.


- **Alyssum saxatile**. Common alyssum. Height: 1-2 feet. Delicate, pink, white, or purple flowers bloom from early spring to late summer. Good for rock gardens and borders. Zone 5-8.


- **Ajuga reptans**. Common ajuga. Height: 1-2 feet. Dark blue to purple or white flowers bloom from late spring to early summer. Good for ground cover and borders. Zone 3-9.

- **Althaea rosea**. Common hollyhock. Height: 6-8 feet. Tall, showy flowers that bloom from early summer to late summer. Requires staking. Zone 3-9.

- **Alyssum**. Common alyssum. Height: 1-2 feet. Small flowers in white, pink, purple, or red. Good for borders, rock gardens, and raised beds. Zone 4-8.


- **Alyssum saxatile**. Common alyssum. Height: 1-2 feet. Delicate, pink, white, or purple flowers bloom from early spring to late summer. Good for rock gardens and borders. Zone 6-10.

- **Anemone**. Common anemone. Height: 1-3 feet. Showy flowers that bloom from late spring to early summer. Requires staking. Zone 4-9.

- **Aristolochia**. Common arnica. Height: 1-2 feet. Showy flowers that bloom from early summer to late summer. Requires staking. Zone 4-9.

- **Asclepias syriaca**. Common milkweed. Height: 2-6 feet. Large, showy flowers that bloom from late spring to early summer. Requires staking. Zone 4-9.

- **Aster novi-belgii**. Common aster. Height: 1-3 feet. Showy flowers that bloom from late summer to early fall. Requires staking. Zone 5-9.


89. Anemone tabernaemontana. Blue star, willow anemone. Height: 2-3 feet. This clumping southeastern native can grow to 3 feet wide with terminal clusters of star-shaped, steel blue flowers that bloom from late spring to early summer. Narrow, gently tapering foliage turns yellow in fall and lasts till frost. Prefers full sun, intertilled soil. Cold treat seeds for 2 months. Zone 3-9.


91. Angelica gigas. Angelica. Height: 5-6 feet. This biennial or short-lived perennial herb has tan to burgundy flowers that bloom in July and August on 4- to 8-inch-wide umbels. The large leaves have heavily serrated edges and thick stems with a scent reminiscent of celery. Prefers part shade, especially in hot climates. The life of the plant can be prolonged by removing flowers before seeds form. Do not cover seeds; germinate at 70 degrees. Fresh seeds have higher viability. Zone 4-8.


93. Aquilegia alpina. Alpine columbine. Height: 1-2 1/2 feet. Nothing bright blue or blue-and-white spring flowers with spreading sepals and short, hooked spurs bloom above clumps of blue-green basal foliage. In general, columbines prefer part shade and rich soil. For this species, donor suggests sowing seeds then cold treating for three weeks before germinating at 70 degrees. It’s probably best to sow columbines outdoors in fall or early spring without covering the seeds. Zone 4-9.


95. A. canadensis. Canadian columbine. Height: 3-3 1/2 feet. Five-petaled flower with spurs of vivid scarlet and yellow. Blooms in late spring to early summer. For culture, see A. alpina. Extended dry storage may improve germination. Zone 3-8.


99. A. tuberosa. Butterfly weed. Height: 3 feet. Tall, erect plant with narrow leaves up to 12 inches long. Flowers, which range from pink to purple and are slightly honey scented, bloom in late summer in the leaf axils. Good for attracting butterflies or for naturalizing. Sow outdoors in fall. Zone 3-8.

100. A. syriaca. Common milkweed. Height: 3-4 feet. Tall, erect plant with narrow leaves up to 12 inches long. Flowers, which range from pink to purple and are slightly honey scented, bloom in late summer in the leaf axils. Good for attracting butterflies or for naturalizing. Sow outdoors in fall. Zone 3-8.


102. Baptisia australis. False indigo. Height: 2-6 feet. Forms large clumps of goatlike blue-
green leaves. In summer, long racemes of blue flowers emerge. Sow in late fall or in early spring. Spring-sown seeds should be scarified. Zone 4-9.


104. Chasmium latifolium. Northern sea oats, wild oats. Height: to 3 feet. A clumping, warm-season grass with leaves like bamboo and flowers like oats. The flowers appear in August and turn copper in fall, then gray in winter. Does best in some shade. Native to streambanks, so ensure adequate moisture. Self-sows. Germination rate may be low because many flowers are sterile. Zone 5-9.

105. Chasmanthium sp. Sea oats. Height: 3 feet. Donor unsure of species. A clumping grass with narrow leaves and creamy-white flowers that drop in 5- to 10-inch panicles. The flowers develop in late summer and turn bronze in fall. Useful for winter effect and in dried arrangements. For culture, see C. latifolium. Zone 3-9.


110. Coreopsis cordifolia. Collegeweed. Height: to 6 feet. Width: to 4 feet. This stately plant forms a large, open inflorescence above a low mound of heart-shaped, deeply lobed leaves. The inflorescence, which resembles baby's-breath, is a multi-branched panicle of small white flowers that bloom from late spring to early summer. Germinate seeds at 40-45 degrees in moist medium. Seeds do not store well. Zone 5-9.

111. Delphinium sp. Larkspur. Height: 4-6 feet. Donor unsure of species. Blue, red, pink, white, or yellow flowers bloom profusely from early to midsummer on showy spikes above lobed leaves. May need staking. Young leaves and seeds of some delphiniums are toxic. Deadhead to induce reflowering. Prefers moist, slightly alkaline soil. Start indoors in late winter for flowers first year. Sow outdoors in spring or summer for flowers in second year. Zone 3-7.


114. Dierama sp. Wandflower, angels' fishing rod. Height: 2-4 feet. A tender perennial grown as an annual or greenhouse plant in most of the U.S. Purple and pink tubular flowers bloom on arcing, wiry stems in summer. Grasslike foliage grows in clumps. Start indoors and transplant outdoors in warm soil. Zone 8-10.

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115. Digitalis lanata. Grecian foxglove. Height: 3 feet. Reddish brown stems are densely covered with lance-shaped leaves that are pubescent underneath. In late spring to early summer, one-sided racemes of bell-shaped flowers are gray to brown outside and white with brown veins inside. Most foxgloves are biennials or short-lived perennials and will die after flowering; however, their lifespans may be extended by removing flower heads before seed is set. If allowed to set seed, they self-sow readily. Seeds sown outdoors in early fall or started in a greenhouse during winter should flower the following summer. Do not cover seeds. Germination is rapid in warm soil. Zone 6-8.

116. D. lutea. Straw foxglove. Height: 2-3 feet. Abundant racemes of small, light yellow to white tubular flowers bloom from early summer to early fall. Foxgloves prefer part sun and rich soil. For culture, see D. lanata. Zone 3-8.

117. D. purpurea. Common foxglove. Height: 2-4 feet. Extremely showy, tube-shaped, terminal flowers are either pink or white tubular flowers bloom from early summer to late summer. The thready, spreading roots form a thick mat. For culture, see D. lanata. Zone 3-8.

118. D. purpurea 'Foxy'. Common foxglove cultivar. Height: 3-5 feet. This cultivar blooms the first year if plants are started indoors in late winter. Flowers are pink with yellow stamens. For culture, see D. lanata. Zone 4-9.

119. Digitalis spp. Foxglove mix. Height: 2 feet. Tube-shaped terminal flowers are either yellow or white. For culture, see D. lanata. Zone 4-9.

120. Echinacea purpurea. Purple coneflower. Height: 2-5 feet. Sturdy, coarse, hairy plant has leafy, branching stems and solidly, daisylike flowers up to 6 inches across. The dropping petals vary from purple to pink to almost white, around a prickly, bronze-colored cone. Easy, low-maintenance plant. Zone 3-8.


125. Eryngium alpinum. Sea holly. Height: to 2½ feet. Each plant bears three to five cylindrical steel blue flower heads surrounded by slightly prickly, furtlly bracts that resemble holly leaves. Blooms July to August. Steel blue stems rise from rosettes of glossy, leathery basal leaves. Excellent for dried arrangements. Eryngiums prefer dry, sandy, deep soil and are tolerant of drought and heat, but can be difficult to transplant once taproot forms. Cold treat to improve germination. Zone 3-8.

126. E. bourgattii. Mediterranean sea holly. Height: 1-2 feet. Small, dark blue midsummer flowers are surrounded by spiny bracts. Prickly, finely divided foliage is gray-green with white veins. Can be difficult to germinate. Sow in moist soil and warm treat, then cold treat, then germinate at 65-75 degrees, or sow outdoors in fall. For culture, see E. alpinum. Zone 3-8.


128. E. yuccifolium. Rattlesnake master. Height: 3-4 feet. Whitish, rounded flowers are 1 inch across. Taller branches are leafless with few bracts. Prefers dry, slightly acid soil and needs a generous topsoil depth to accommodate its long taproot. Performs well in both shady woodland edges and sunny prairie settings. Good for dried arrangements. Difficult to germinate. Cold treat for 2 months. Zone 4-8.

129. Eupatorium coelestinum. Mist flower, hardly ageratum. Height: 1-3 feet. Dense showy clusters of blue or violet flowers bloom from late summer to fall. Light green, opposite leaves surround pubescent, red-brown stems. Prefers moist sunny sites, especially beside pools or streams. Can be invasive. Cold treat in moist medium. Zone 5-10.

130. E. fistulosum. Joe-pye weed. Height: 6-10 feet. Forms clumps up to 3-4 feet wide. Dome-shaped heads of pale pink to red or lavender flowers bloom in clusters up to 18 inches across. Blooms in late summer or fall on hollow stems spotted...
132. **Euphorbia lathyris**. Mole plant. Height: to 6 feet. A cosmopolitan weed said to repel moles. Narrow, leathery, gray-blue leaves encircle the lance-shaped flower stems above a clump of yellow-green flowers bloom in terminal cyrnes in late summer. All parts of the plant contain a milky sap that can cause a contact skin rash. Zone 5-9.

133. **Fibigia clupeata**. Fibigia. Height: 1-2½ feet. An erect plant with oval to lance-shaped green or gray-green leaves covered with fine hairs. Yellow flowers are followed by flat, elliptical, often hairy fruits (siliques) that offer a decorative effect in summer. Prefera gravelly loam. Mediterranean native is useful in rock gardens. Difficult to germinate. Zone 4-8.


138. **Galtonia candicans**. Summer hyacinth. Height: 2-4 feet. Drooping, bell-shaped white flowers in a loose raceme are borne on stalks above a clump of 2- to 3-foot-long basal leaves. This South African native flowers for about four weeks in midsummer; fragrant ornamental seed pods form by early fall. In colder climates, bulbs must be dug in fall and overwintered. Effective in large containers. Easy to germinate; self-sows. Zone 6-9.


140. **Helianthemum autumnale**. Sneezeweed. Height: 2½-6 feet. Erect plant that has elongated, alternate, serrated leaves and daisylike orange, yellow, and red daisylike flowers that bloom late summer to frost. Zone 3-8.


142. **Hesperis matronalis**. Sweet rocket. Height: 1-3 feet. Fragrant, showy white, purple, or blue flowers produced in loose terminal racemes. Blooms in May and June. Self-seeds prolifically. If seeds are started in winter or early spring, plants will bloom the first year. Does best with light shade and damp, well-aerated soil. Sow in warm soil. Do not cover seeds. Zone 3-8.

143. **Hibiscus coccineus**. Scarlet rose mallow. Texas star hibiscus. Height: 6-8 feet. Deep reddish funnel-shaped flowers, 5-6 inches wide, in mid- to late summer. Narrow upright habit. A wetland native, but tolerant of drier soils. Full sun to light shade. Hibiscus seeds can have a low germination rate. This species should be sown without covering in warm soil. Zone 6-9.

144. **H. moscheutos**. Common rose mallow. Height: 3-8 feet. Impressive 6- to 12-inch flowers are red, white, pink, or bicolor, some with a dark center. Blooms from midsummer to frost. Its many stems and 8-inch leaves give the plant a shrubby form. Full or part sun and moist, rich soil. Sow seeds outdoors in full, uncovered. Zone 5-9.


146. **Hosta 'Frances Williams'**. Frances Williams hosta. Height: 2 feet. Ribbed, blue-green leaves have yellow edges. White flowers rise on slender stalks just above clumping, basal foliage. For culture, see 'Big Sam'. Zone 3-8.

147. **Hosta montana** (formerly **H. elata**). Hosta. Height: 2-3 feet. Distinctly shaped leaves with a wide margin and pale lilac flowers on scapes that bloom in early summer. For culture, see 'Big Sam'. Zone 3-8.

148. **H. sieboldiana**. Siebold hibiscus. Height: 1½-2 feet. Ornate 10- to 15-inch-long gray-green ribbed leaves form a rosette up to 4 feet wide. Flowers are pale lilac to waxy blue on scapes not much taller than the leaves. For culture, see 'Big Sam'. Zone 3-8.

149. **H. ventricosa**. Blue plantain lily. Height: 3 feet. Dark green leaves are up to 9 inches long and 5 inches wide. Bell-shaped late-summer flowers are violet-blue on 3-foot stems. For culture, see 'Big Sam'. Zone 3-9.

150. **Hosta sp.** Hosta species. Height: 1½ feet. Donor unsure of species. A mid-season bloomer with lavender flowers and light gray-green leaves with a creamy white border. For culture, see 'Big Sam'. Zone 4-8.


153. **Iris pseudacorus**. Yellow iris hybrid. Height: 5 feet. Donor crossed yellow-flowered iris with three white-flowered varieties, so seeds may produce flowers in various combinations of white and yellow. Blooms in late spring. Sow uncovered in fall in most area. Zone 5-9.

154. **I. setosa**. Wild flag, bristle-pointed iris. Height: 3 feet. Native to both northern North America and northeast Asia, this iris has 3-inch purple flowers in late spring to early summer. The inner petals, or standards, are small and bristlike. Tolerant of damp conditions. Sow uncovered in fall. Zone 3-8.


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158. **Knautia macedonica**. Knautia. Height: 2-½ feet. Dense clumps of stems rise from a rough rosette and hairy basal leaves. Dark red to dark purple flowers persist from July to September. Ideal for naturalizing in a woodland garden. Native to the Balkan region of Central Europe; tolerates drought. Zone 6-8.

159. **Leonurus sibiricus**. Motherwort. Height: 3-6 feet. Biennial native to northeast Asia. Spiky whorls of rose or purple flowers bloom on tall stalks. Plants often exhibit three different leaf forms: white or gray fuzzy basal leaves; finely dissected midstem leaves; and entire, lance-shaped upper leaves. Self-sows freely. Zone 4-9.

160. **Leucanthemum × superbum** (formerly **Chrysanthemum × superbum**). Shasta daisy. Height: 2½ feet. White-rayed flowers are up to 3 inches across and have yellow centers. Blooms early summer to frost. The dark green leaves are undivided. Pinch plants to encourage a fuller shape. Sow in warm soil. Zone 4-9.


162. **L. × vulgare** (formerly **Chrysanthemum leucanthemum**). Oxeye daisy. Height: 2-3 feet. A typical daisy flower up to 2 inches across, with white rays around a yellow center. Blooms in late...
often needs staking. Full to part sun in moist, well-aerated, fertile soil. Zone 3-9.


178. Macleaya cordata. Plume poppy. Height: 5-10 feet. This clump-forming member of the poppy family produces enormous stems and 8-inch heart-shaped leaves. In summer, its stems are topped with feathery, foot-long panicles of creamy white flowers, each with a spray of conspicuous stamens. Spreads aggressively by runners. Seeds are collected from AHS's River Farm headquarters. Zone 3-8.


180. M. sylvestris 'Brave Heart'. High mallow cultivar. Height: 4-5 feet. Tall spikes of lavender to pink flowers are veined with velvety purple. Full to part sun. Short-lived, but usually self-seeds. Sow outdoors in early spring. Slow to germinate. Zone 4-8.

181. M. sylvestris 'Zebrina'. High mallow cultivar. Height: 3 feet. Blooms in a mass of white to pink flowers with purple markings from July to October. Full to part sun. Short-lived, but usually self-seeds. Zone 4-8.


187. **Papaver rupifragrum**. Poppy species. Height: 18 inches. This native of Spain has refined orange to red flowers that bloom in late spring to early summer on long, branching stalks. Basal foliage is narrow and finely serrated. Store in dry, cool place for 3 months before germinating, or sow outdoors. Zone 6-9.

188. **x Pardancanda norrisii**. Park's candy lily hybrid. Height: 3 feet. A cross between *Pardanthopsis* and *Belamcanda* that bears 3- to 4-inch blooms in yellow, blue, red, purple, pink, white, orange, multicolor, striped, and polka dot combinations. Flowers last one day but blooms appear summer through fall. Has iris-like lance-shaped leaves and decorative black seed heads. Heat and drought tolerant. Brilliant, but flowers in one year with long growing season. Can be started indoors or sown outdoors after last frost. Zone 5-10.

189. **Penstemon eatonii**. Penstemon. Height: 1-3 feet. A short, erect, subshrub with silver-green stems and basal foliage. Tubular scarlet flowers bloom in summer on terminal spikes. To avoid moisture build-up around the crown and roots, soil should be very well-aerated. Cultivars tolerant. Zone 5-9.

190. **P. grandiflorus**. Penstemon. Height: 2-4 feet. Donor says 25 to 30 percent of seeds are from 'Albus' cultivar. An evergreen rosette of gray-green foliage forms the base for this large-flowered penstemon. The broadly bell-shaped and slightly bearded 2-inch-long flowers are displayed on 8- to 10-inch spires. Flowers of the species are lilac to bluish lavender, while those of the cultivar are white. For culture, see P. eatonii. Zone 3-9.


192. **Platycodon grandiflorus**. Balloon flower. Height: 2-3 feet. Upright, sparsely leaved stems produce large blue, pink, or white buds resembling balloons. Flowers are up to 3 inches across and can last most of the summer. Plants appreciate some shade in the South. Zone 3-8.

193. **P. grandiflorus** 'Fuji'. Balloon flower cultivar. Height: 2-3 feet. Blue-flowered plant from Fuji series of balloon flowers. For culture, see species. Zone 3-8.

194. **Potentilla** sp. Cinquefoil. A sprawling, prostrate plant that has a growth habit much like that of strawberry. Small golden yellow flowers are borne in loose cymes and bloom in spring. Palmately compound leaves have 3-5 leaflets with sharply serrated margins. Zone 4-8.


196. **Rhexia virginica**. Meadow beauty. Height: 1½ feet. A native of bogs and sandy marshes of central North America. Features reddish-striped stems and oval to lance-shaped leaves that are hairy on the surface and shiny beneath. Inch-wide pink to purple flowers are borne solitary or in terminal cymes in July and August. Does best in sunny, moist sites in peat-sand mix. Sow seeds, uncovered, in cold frame or outdoors in pots and grow seedlings for about two years before transplanting into the garden. Zone 6-9.


198. **R. hirta** 'Gloriosa Daisy'. Black-eyed Susan cultivar. Height: 2-3 feet. Gold, yellow, bronze, orange, brown, and mahogany single flowers are 3-6 inches wide and have center bands of brown, yellow, or black. Full sun to part shade. Prefers rich, moist soil, but will grow in poor soil. Heat and drought tolerant. Zone 4-8.

199. **R. maxima**. Great coneflower. Height: 5-7 feet. Large yellow flowers are carried atop tall slender stems and bloom mid- to late summer. Large blue-green, paddle-shaped basal leaves are up to 18 inches long. Ideal for naturalizing. Zone 6-10.

200. **R. nitida**. Coneflower. Height: 2-4 feet. Upright plants with bright green leaves and 3- to 4-inch-wide, yellow, daisy-like flowers with drooping petals that bloom on slender stems in mid- to late summer. Heat and drought tolerant. Self-seeds easily and may become invasive. Zone 4-10.


203. **Sagittaria latifolia**. Wapato, broad-leaved arrowhead. Height: to 4 feet. Native to bogs and wetlands in North America. Arrow-shaped leaves and white flowers in whorls of three arise on slender erect petioles from tuberous roots. Often grows submerged in shallow water. Blooms late summer to fall. Donor says seeds should be sown immediately in pots placed in shallow trays of water. One study indicated that seeds require 6 months of immersion in cold water to germinate. Zone 5-10.

204. **Salvia jurisicii**. Salvia. Height: 18-24 inches. Loosely-branched racemes of inverteved violet to blue flowers bloom in early summer above bushy, blue-green to gray, papery foliage of this central European native. Do not cover seeds. Zone 6-9.

205. **Sanguisorba obtusa**. Japanese burnet. Height: 3-4 feet. This native of Japan has gray-
green compound leaves up to 18 inches long and reddish pink flowers in 4-inch spikes. Long stems in the flowers create a fluffy appearance. May need some midday shade in the South. Can be invasive. Zone 4-9.

206. *S. temufoia*. 'Burnet. Height: 3-4 feet. Native to wet meadows and streambanks of eastern Asia, this species has large, mostly basal, compound leaves made up of 11-15 deeply serrated leaflets. Pink to purple flowers up to 3 inches long bloom on terminal spikes in late summer and fall. Zone 3-8.


210. *Sidalcea malviflora*. Checkermoon, prairie mallow. Height: 2-4 feet. Silky pink flowers open off terminal raceme surmounting round, glossy green basal leaves. Blooms in summer and may be deadheaded to encourage reblooming and additional basal growth needed for overwintering. Grows well in both full sun and part shade. Prefers moist, loamy soil and cool climates. Seeds can be started indoors or sown outdoors after last frost. Zone 5-10.


212. *S. californicum*. Height: 3-feet. Taproot biennial with white, finely divided aromatic leaves and flat clusters of small, yellow, button-like flowers. Useful for dried arrangements. Plants are said to repel ants. Not particular about growing conditions. Can be invasive. Zone 3-9.


231. *V. panurensis*. Brazilian verbena. Height: 3-6 feet. A non-clinging vine with erect herbaceous stems. Solitary terminal flowers bloom June through September in colors ranging from blue to violet. Top needs full sun, but keep roots cool with moisture-retaining soil rich in compost and peat moss, and by mulching. Clematis seeds can be difficult to germinate or show low viability. Sow outdoors in fall for spring germination. Cold treat to germinate indoors. Zone 3-8.


237. *Clematis integrifolia*. Solitary clematis. Height: to 2-3 feet. A clump-forming vine with erect herbaceous stems. Solitary terminal flowers bloom June through September in colors ranging from blue to violet. Top needs full sun, but keep roots cool with moisture-retaining soil rich in compost and peat moss, and by mulching. Clematis seeds can be difficult to germinate or show low viability. Sow outdoors in fall for spring germination. Cold treat to germinate indoors. Zone 3-8.


241. *C. recta*. Clematis. Height: to 2-3 feet. A clump-forming vine with erect herbaceous stems. Solitary terminal flowers bloom June through September in colors ranging from blue to violet. Top needs full sun, but keep roots cool with moisture-retaining soil rich in compost and peat moss, and by mulching. Clematis seeds can be difficult to germinate or show low viability. Sow outdoors in fall for spring germination. Cold treat to germinate indoors. Zone 3-8.

242. *C. reticulata*. Clematis. Height: to 30 feet. An autumn-blooming variety that bears fragrant 2- to 4-inch white flowers. Sturdy climber with stout branches, leathery compound leaves, and bountiful clusters of slender stems. For culture, see *C. integrifolia*. Zone 3-8.


244. *C. reticulata*. Clematis. Height: 5-9 feet. A climbing vine with small, dry, triangular fruit. Bears pale to deep pink flowers from early summer to frost. Foliage is delicate and fernlike with foliage clusters. Prefers moist, rich soil. Sow-seeds in damp places. Zone 4-8.

side and gray to yellow and downy outside, bloom from late spring into fall. For culture, see C. integrifolia. Zone 6-9.

235. C. versicolor. Leather flower. Height: 4-12 feet. This native of the central and southeastern U.S. bears solitary, green-tipped, dull purple to blue flowers with two bracts near the base. Its compound leafy leaves have up to eight elliptical leaflets. For culture, see C. integrifolia. Zone 5-9.

236. Clematis spp. Clematis. Donor unsure of species. Height: to 12 feet. A mix of clematis seeds that will produce vines with flowers that can range from white to lavender. Hardiness unknown, but donor lives in Zone 6.


238. Dolichos lablab. Hyacinth bean. Height: 6-10 feet. An ornamental member of the pea family with 1-inch-long pinkish-purple flowers. The 2-inch purple pod contains black or white seeds. These are edible but should be thoroughly cooked with two to four water changes.

239. Ipomoea coccinea. Star ipomoea. Height: 10 feet. A slender-stalked, fast-growing annual with large, bright green leaves and incandescent red tubular flowers. Native to eastern and central U.S. Nootch seeds or soak in tepid water before sowing.

240. I. purpurea "Crimson Rambler". Common morning glory cultivar. Height: to 8 feet. Fast-growing annual climber with showy funnel-shaped maroon flowers that bloom in late summer. Has heart-shaped leaves and delicate stems that require a trellis for support. Nootch seeds or soak in tepid water before sowing outside after danger of frost has passed.


242. I. x multijida. Cardinal climber, hearts-and-honeys vine. Height: to 12 feet. I. quamoclit hybrid has more maplerike leaves that turn burgundy in fall.

243. Ipomoea spp. Morning glory species. A mixture of species from this genus of tough, fast-growing annual vines with large trumpet-shaped flowers. Will tolerate some shade. Excellent for training or interplanting with other climbers. Can be somewhat invasive. Soaking seeds overnight will speed germination.

244. Lathyrus latifolius. Sweet pea, vine, perennial pea. A 6- to 9-foot climbing vine with blue-green foliage and typical pea family flowers in midsummer. Those offered are pink and white or plain white. Very adaptable. Scarification or an overnight warm water soak may improve germination. Zone 3-9.

245. Passiflora incarnata. Maypop, wild passionflower. Height: to 30 feet. Bears 3-lobed leaves and purplish pink flowers 2 inches across. Blooms in late summer and produces an edible yellow fruit that is opened by squeezing until it pops. Perennial that dies to ground in winter. Spreads by root and can be invasive. Will tolerate partial shade; requires moist, well-aerated soil. Can be difficult to germinate. Sow in warm soil. Zone 7-10.


247. Tropaeolum peregrinum. Canary creeper, canary vine. Height: to 9 feet. A perennial in its native South America, this climber is treated as a half-hardy annual north of Zone 9. Long-stalked flowers are lemon yellow with red spots at the base and a hooked green spur. Light green, heart-shaped, slightly scrunched leaves have five deeply cut lobes.

248. Tweedia caerulea (syn. Oxypterygium caeruleum). Southern star. Height: to 3 feet. A gently twining subshrub native to South America that can be grown as an annual in temperate climates. Sparsely branched stems are covered with fine white down. Inch-wide ray-shaped flowers are light blue with a tinge of green when young and turn darker to nearly lilac with age. Blooms in autumn if grown as an annual. Pinch back young plants to encourage branching.

**TREES & SHRUBS**

Tree seeds are often difficult to germinate because they have impenetrable seed coats or other complicated mechanisms to protect them from early germination. Many of the entries in this section incorporate germination advice from seed studies conducted by Norman Deno and published in his book, *Seed Germination Theory and Practice*. (See sidebar, page 9.) To sprout tree seeds, it is usually necessary to keep them moist while exposing them to one or more cycles of warmth and cold. Depending on where you live and the relative size of your indoor and outdoor space, you may want to plant tree seeds in a protected area outdoors, and let nature do the warm and cold conditioning. Conditioning seeds indoors clearly gives the grower more control, and Deno found some seeds almost impossible to start outdoors. Unless noted otherwise, cold conditioning means 3 months at 40 degrees, and warm conditioning is 3 months at 70 degrees. It may also be necessary to break the seed coat physically, a technique called scarification. This can often be done by rubbing the seeds with sandpaper, but larger seeds may need to be nicked with a knife.


250. Acer buergerianum. Trident maple. Height: 20-35 feet. Large shrub or small tree with a loose, open habit. Its common name is derived from its leaves, which have three triangular-shaped lobes. Fall color ranges from scarlet to orange-yellow. Numerous small, greenish white florets bloom in May on blue-green leaves, inconspicuous samaras mature in fall. A handsome specimen tree. Cold treat. Zone 6-9.

251. A. circinatum. Vine maple. Height: to 36 feet. Native to moist woods and streambanks in maritime northwestern North America, this is a multi-stemmed, somewhat shrubby tree with variable fall color. Its leaves have a heart-shaped base with multiple, toothed lobes. Red, winged fruits make a colorful display in late spring. Germination may be difficult. Soak seeds in water for several days and carefully remove or nick seed coats before cold treating seeds, or sow outdoors and allow to go through natural cycles of cold and heat. Zone 6-8.

252. A. fruticosa. Paperbark maple. Height: 20-30 feet. Width: 15-35 feet. Slow-growing tree with rounded to oval habit. Ornamental value enhanced by cinnamon-brown bark, which peels after several years to expose brilliant red bark. Dark green-blue-green leaves consist of three coarsely toothed leaflets; fall color can be spectacular bronze to red in northern states. Fuzzy, winged samaras form in spring after solitary greenish flowers bloom. Large percentage of seeds are infertile. Cold treat seeds, then carefully remove or nick seed coats and warm treat. Zone 5-8.

253. A. pensylvanica. Striped maple. Height: 15-30 feet. Decorative ornamental tree has green bark striped with white. Large, oval, three-lobed leaves turn bright yellow in fall. Difficult to germinate unless impervious seed coat is removed or nicked and seeds cold treated. Zone 3-7.

254. A. rufinerv. Redvein maple. Height: 20-30 feet. Native to Japan, this is a large shrub to small tree with an uneven rounded to flat-topped crown. Young stems are shiny blue to white; older bark is red to brown with white stripes. Leaves are three triangular lobes with the central the largest, dark green above and pale green below with reddish veins. Flowers bloom in 3-inch-long, reddish brown, pubescent racemes in May. Reddish brown samaras, initially covered with fine hairs, form later. Does best in part shade. Cold treat. Zone 6-8.

255. Albizia julibrissin. Silk tree, mimosa. Height: 20-35 feet. A vase-shaped, multi-stemmed tree with a flat to slightly rounded crown. Compound leaves formed of multiple small leaflets and showy pink to orange flower clusters between May and July give the tree an airy and slightly tropical look. Carefully nick or puncture seed coats before germinating at 70 degrees. Zone 6-9.

256. Amorpha fruticosa. Indigobush amarpha, false indigo. Height: 6-20 feet. This deciduous shrub, native to the central and southern United States, can reach 5-15 feet wide, but tends to become lanky over time. Its bright green compound leaves have up to 30 oval to elliptical leaflets per stem. The flowers, which bloom in June on upright spikes, are a purplish blue with orange anthers. Small kidney-shaped seed pods form in fall and sometimes persist into winter. Tolerant of poor, dry, sandy soils. Self-seeds and can become invasive. Nick or puncture seed coats and cold treat, or sow outdoors in fall. Zone 5-9.

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258. **Bauhinia variegata** (syn. **B. purpurea**). Purple orchid tree. Height: 20-35 feet. Native to central and eastern Asia, this large shrub to small tree has spectacular pink to purple orchidlike flowers that bloom from January to April. Leaves are light green and double lobed. Inclined to shed tipped seed pods form in summer. Germinate seeds at 70 degrees in dryish medium. Zone 9-11.

259. **Betula platyphylla**. Asian white birch. Height: 60 feet. This native of eastern Asia has two botanical varieties, one of which has a pyramidal habit while the other is more spreading. Both have pure white, peeling bark with dark triangular markings and broad, oval, coarsely serrated leaves. Fall color ranges from yellow to red. Birch seeds are notoriously infestive. Cold treat then warm treat, uncovered. Zone 3-8.

260. **Butia capitata**. Jelly or pindo palm. Height: 10-20 feet. Native to South America, this is a relatively hardy species with a trunk to about 18 inches in diameter, often covered with old leaf bases. Arching fronds are made up of many feathery blue-green leaves. Incl-long, oblong, yellow to orange edible fruits hang in clusters after flowering. Requires lengthy germination; sow in moist peat with bottom heat. Zone 8-11.

261. **Buxus microphylla** var. **koreana**. Boxwood. Height: 3-4 feet. A hardy, slow-growing variety native to Japan that grows up to 6 feet wide with a loose, open habit. It has small oval elliptical leaves that turn yellowish in winter. Insignificant flowers are fragrant and attract bees. Cold treat. Zone 3-5.

262. **Callicarpa americana**. American beautyberry. Height: 3-8 feet. A loosely branched, open shrub with coarse, light green, fuzzy foliage and a copious load of 1/4-inch violet fruits in fall or part sun. Best to sow seeds in fall. Zone 7-10. In Zone 5-6, berrybeauty may still be worth growing but will die back to the ground in winter.

263. **Catalpa bignonioides**. Bignonia. Height: 30-70 feet in cultivation. A staking columnar species that rarely gets wider than 10 feet. Dark green, aromatic, needlelike leaves are clustered in fours. The bark is grayish green or reddish and smooth on young trees and becomes brown to red and fibrous with age. Cylindrical tapering cones ripen to reddish brown in early autumn and remain on the tree until spring. Intolerant of polluted or windswept conditions, but tolerates some drought and heat. Native to western U.S. Cold treat or sow outdoors in fall. Zone 5-8.

264. **Camellia sp.** Camellia. Donor unsure of species. Height: 10-15 feet. A slow-growing evergreen shrub that can reach 6-10 feet in diameter. Has glossy dark, leathery foliage and

bears flowers that range from white to red. Depending on species, blooms open from fall through early spring. Prefers part shade and moist, well-aerated, acidic soil high in organic matter. Seeds are slow to germinate and should be soaked in hot water for 24 hours before sowing. Zone 7-9, but range can be extended in warmer coastal states and by using plants in protected locations.

265. **Caryocar brasiliense**. Brazilian peashrub or peetree. Height: 15-20 feet. An erect, somewhat oval shrub with sparse branches that can reach 12-18 feet in diameter, this native of northeastern Asia has 2-3-foot compound leaves composed of eight to 12 oval, spine-tipped, light green leaflets. Bright yellow flowers bloom in spring on old wood. Brown beaklike seed pods ripen in late summer and explode. This nitrogen-fixing legume is tolerant of poor soils and will grow in acidic soils. Useful as windbreak or wildlife plant. Nick or puncture seed coats before sowing. Zone 2-7.

266. **Caragana arborescens**. Siberian pea shrub or peetree. Height: 3-4 feet. A deciduous shrub with gray-green aromatic leaves and clumped sky blue flowers that bloom in late summer. Woody stems should be cut back hard in spring. Zone 6-8.

267. **Cassia alata** (syn. **Senna alata**). Ringworm cassia. Height: 8 feet. A large-leaved shrub native to the tropics. Bears large yellow flowers on spike-like racemes and leaves up to 2 feet long. Winged seed pods turn black when mature. Used by natives to treat ringworm. Prefers soil with a loam-sand mix. Seeds should be soaked in hot water and scarified before sowing indoors. Transplant outdoors after danger of frost has passed. Zone 8-11.

268. **Catalpa sp.** Catalpa species. Height: 40-60 feet. A narrow, open, sometimes irregular tree with an oval crown. Large, heart-shaped leaves provide an exotic look and turn yellow in fall. Spectacular clusters of white blossoms with gold and purple markings inside bloom in upright panicles in May and June. Pendulous narrow seed pods develop in late summer and can persist into winter. Do not cover seeds during germination. Zone 4-8.

269. **Cercis canadensis**. Eastern redbud. Height: 20-30 feet. A small deciduous tree native to the eastern U.S. Reddish purple blooms appear in April lasting 2-3 weeks until flower-shaped foliage begins to develop. Palcate seed pods develop in summer. Thrives in full sun to part shade and prefers moist but well-aerated soil. Germination can be difficult and may take several months. Try alternating warm and cold treatments before sowing indoors or, sow outdoors in fall. Zone 4-9.

270. **Chionanthus virginicus**. Fringe tree, oldman’s beard. Height: 15-25 feet. A large shrub or small tree with variable habit from bushy to spreading or even open and straggly. Native to the East Coast from New Jersey south to Florida and Texas. Opposite leaves are narrow and elliptical to oval with fine hairs on the undersides. Slender fragrant flowers droop in raceme-like panicles in May. Dark blue drupes that dangle unsubtly from the leaves ripen in early fall. Beautiful, pollution-tolerant species shrub or tree. Seeds have double dormancy that can be broken by a cold treatment sandwiched between two warm treatments. Zone 4-9.

271. **Cladrastis kentukea**. American yellowwood. Height: 30-50 feet. Deciduous tree indigenous to southeastern and south central U.S. Has rounded, wide-spreading form with compound bright green leaves that turn yellow to orange in fall. Fragrant white flowers in pendulous panicles bloom in June. Sow seeds sowed from fresh seed pods, or notch seed coats of dry seeds. Zone 3-8.

272. **Corylus cornuta**. Flowering dogwood. Height: 30 feet. Native to eastern North America, this is a small, low-branched tree with a flat or slightly rounded crown. Opposite oval leaves are dark green above with prominent veins and turn reddish purple in autumn. Insignificant greenish yellow flowers that bloom in April to May are encased by four showy white bracts. Clusters of glossy red fruits form late in summer and provide interest and food for wildlife. Slow to germinate. Sow outdoors in fall or alternate cold and warm treatments. Zone 5-9.

273. **C. kousa var. chinensis**. Chinese or Kousa dogwood. Height: 20-30 feet. Vase-shaped in youth, this Asian native becomes rounded with age. Gray-brown bark exfoliates to create mosaic effect on trunk. Opposite oval to elliptical leaves have prominent veins on the upper surface and reddish purple in fall color. As with C. floridensi, insignificant flowers are surrounded by four creamy white bracts, but bloom about three weeks later than the American native. Attractive rounded, pinkish drupes with a bumpy, leathery casing develop in late summer. The interior flesh is edible but insipid. Cold treat or sow outdoors in fall. Zone 4-8.

274. **C. mas.** Cornellian cherry, sorbet. Height: 20-25 feet. A small, multistemmed tree with a rounded form and exfoliating bark. Yellow flowers bloom for 3 weeks in March before foliage emerges. Dark green leaves are joined by six bracts around each true flower. Does not generally perform well in the East or Midwest. Cold treat or sow outdoors in fall. Zone 8-10.
282. Hibiscus. Spontaneous. Unsure of species. Height: 8-12 feet. Dense growth of trunks as a perennial in Zone 3/6, cutting it to the ground in fall. Can also be pruned heavily in spring. New growth bears pink blooms from July through September. Prefers full sun and loamy soil. Can be difficult to germinate. Plant seeds outdoors in fall, or cold treat and plant indoors in early spring. Difficult to transplant. Supplemen-
corky corrugations. Gray-green catkins appear in late summer. The edible fruit is widely used in eastern Asia. Lustrous dark green leaves are felted undersides that turn a rich purple in fall. Cream-
283. Hypericum frondosum. Golden St. John’s-wort. Height: 3-4 feet. Upright to rounded southeastern native shrub with reddish brown peeling bark and slender, oval leaves. Bright yellow to 1-2-inch-wide flowers bloom in mid-
summer, followed by small reddish brown capsule fruits. Do not cover seeds. Zone 5-9.

284. Hypericum sp. St. John’s-wort species. Height: 2½ feet. Compact shrub with yellow flowers that bloom in midsummer. For cul-
ture, see H. frondosum. Zone 3-9.

285. Koelreuteria paniculata. Panicked golden rain tree. Height: 40 feet. Spread may exceed height. A dense, broad tree with long, pinnate leaves and showy panicles of yellow, yellow-
flowers in July. Flower clusters can exceed a foot in length. Prefers full sun but adapts to a wide range of soil conditions. Self-sows prolifically. To speed germination, it may help to scarify seeds. Warm treat, cold treat, then sow in warm soil. Zone 5-9.

286. Liriodendron tulipifera. Tulip tree. Height: 70-90 feet. Fast-growing tree with pyramidal form that matures to a rounded

287. Magnolia kobus var. stellata. Star magnolia. Height: 15-20 feet with a spread of up to 15 feet. Fragrant, white, star-shaped flowers 3 inches across are tinged with pink. Blooms in early spring before leafing out. Close-set oval leaves give the tree a dense habit. Likes moist, acidic soil in a protected spot. Avoids southern exposure, which tends to cause early bud break. Cold treat, then sow indoors. Zone 4-9.

288. M. macrophylla var. ashei. Ashe magnolia. Height: 25 feet. Good small specimen tree, similar to species but with smaller leaves and shrub-like habit. Leaves are bright green above, silvery beneath. Perennial bloomer known to flower when less than a foot tall, its creamy white fragrant flowers open in June. Native from Florida west to Texas, but now rare in the wild. Prefers partly shaded site and moist, loamy soil. Before germination, seeds should be soaked for three days and outer seed coat removed. Cold treat seeds for indoor germination, or plant outdoors in fall. Use soilless potting mix that drains well to avoid seed rot. Zone 6-9.

289. M. virginiana. Sweet bay or swamp magnolia. Height: 10-60 feet. Native to the eastern U.S. from Massachusetts to Florida and Texas. Sweet bay magnolia in a multistemmed deciduous shrub in the North, but can be an evergreen tree with pyramidal habit in the South. It has 3-
to 5-inch-long elliptical leaves that are dark green above and silvery green below. Scattered creamy white, lemon-scented flowers up to 3 inches wide bloom in May and June. The fruit is open to expose bright red seeds in late summer. Cold treat or plant outdoors in fall. Zone 5-10.

290. Ostrya virginiana. American hornbeam, ironwood. Height: 25-40 feet. A native of eastern North America with drooping or hori-


293. Pieris japonica. Japanese pieris. Height: 9-12 feet. An upright evergreen shrub with a tidy habit and stiff, spreading branches. Losses may occur if plants are not given adequate light in early spring by fragrant, white, urn-shaped flowers drooping in panicles. Do not cover seeds. Sow on top of milled or screened sphagnum and place under mist or cover with clear plastic. Zone 4-8.

294. Pinus contorta var. latifolia. Lodgepole pine. Height: 70-150 feet. A tall, narrow ever-


297. Pseudotsuga menziesii. Douglas fir. Height: 40-80 feet. Native to Western mountain regions and the Pacific coast, this conifer can reach 200 feet in the wild with a dense, conical shape when young. Blue-green to dark green needles are 1- to

298. Styrax japonicus. Sweet bay magnolia. Height: 10-60 feet. Native to the eastern U.S. from Massachusetts to Florida and Texas. Sweet bay magnolia in a multistemmed deciduous shrub in the North, but can be an evergreen tree with pyramidal habit in the South. It has 3-
to 5-inch-long elliptical leaves that are dark green above and silvery green below. Scattered creamy white, lemon-scented flowers up to 3 inches wide bloom in May and June. The fruit is open to expose bright red seeds in late summer. Cold treat or plant outdoors in fall. Zone 5-10.

continued on page 23
CELEBRATING THE AMERICAN GARDEN 1996

American Horticultural Society
51st Annual Meeting
St. Louis, Missouri  May 30 to June 1, 1996
Program

MEET US IN ST. LOUIS! The Gateway City is the site of the American Horticultural Society's 51st Annual Meeting, "Celebrating the American Garden 1996." Just as Lewis and Clark headed west from St. Louis in 1804 to explore the West, you will use this dynamic city as a springboard for exploring beautiful gardens and new ideas in horticulture.

Thursday, May 30
11 a.m. to 6 p.m.
Registration, Hotel Grand Lobby

1 to 5:30 p.m.
Optional Tour: Gardens around St. Louis

6:30 p.m.
Chairman's Reception and Awards Banquet
Presentation of 1996 AHS Awards by H. Marc Cathey, President
Speaker: Peter Raven, Director, Missouri Botanical Garden

Friday, May 31
7 a.m.
Registration, Hotel Grand Lobby

7:45 a.m.
Continental Breakfast, Hyatt Regency Hotel

8:30 a.m.
Buses depart

9:30 a.m.
Tour of Monsanto Corporation
Chesterfield, Missouri

11:15 a.m.
Buses depart for Luncheon at Old Watson Country Club
Speaker: Ann Lovejoy
"American Mixed Borders"

2:30 p.m.
Tour of the Missouri Botanical Garden

4 p.m.
Tea with Board of Directors of American Association of Botanic Gardens and Arboreta

4:45 p.m.
Buses depart for hotel
Evening Free to Explore St. Louis

Saturday, June 1
8:15 a.m.
Continental Breakfast, Hyatt Regency Hotel

8:45 a.m.
Plenary Session, Hotel Ballroom

9 a.m. to 12 noon
Speaker Series, Hotel Ballroom

9 to 9:45 a.m.
Richard Haag
"A Nursery of Ideas—in Retrospect"

9:45 to 10:15 a.m.
Arthur Tucker
"Natural Sources of Perfumes"

10:30 to 11:15 a.m.
John Fairey & Carl Schoenfeld,
Yucca Do Nursery
"The Treasure of the Sierra Madre Oriental"

11:15 a.m. to 12 noon
Michael Hayman
"The Neighborhood Arboretum: A Challenge and an Opportunity"

12:15 p.m.
Buses depart for Gardens of Ladue
(box lunches served on bus)

5:30 p.m.
Dinner at Ritz-Carlton Hotel, Clayton
GARDENERS' FORUM
AHS Moderator: Gene Miller

8:45 p.m.
Buses return to hotel

Sunday, June 2
10:30 a.m.
Optional Tour: Private Gardens around St. Louis
Lunch at Women's Exchange, Ladue

3:30 p.m.
Buses return to hotel

See you next year in San Francisco April 24 to 26, 1997, at the fabulous Fairmont Hotel on Nob Hill for the 75th Anniversary of the American Horticultural Society!
**Meeting Highlights**

**Speakers**

In his role as director of the Missouri Botanical Garden, Peter Raven has developed Japanese, Chinese, and English woodland gardens, the Climatron, and the demonstration gardens in the William T. Kemper Center for Home Gardening, which received an AHS award in 1993. Through his leadership, the Missouri Botanical Garden has developed a world-renowned tropical plant research program.

Ann Lovejoy is a horticultural writer whose articles have appeared in *American Horticulturist*, *Horticulture* magazine, and the *New York Times*. Her books include the award-winning *The Year in Bloom*, *American Mixed Borders*, *Further Along the Garden Path*, and *The Fragrant Year*, to be published this year. She also writes for several publications in the Pacific Northwest, where she makes her home.

Richard Haag is the founder and lead designer of Richard Haag Associates in Seattle, Washington. His creativity, sensitivity to the natural environment, and adaptive re-use of existing structures are expressed in his more than 500 projects. His series of gardens at the Bloedel Reserve near Seattle has been praised as a "landmark of 20th-century landscape architecture."

Arthur Tucker, a research professor at Delaware State University, has lectured and published extensively on herbs, heritage plants, and the endangered flora of the Delmarva Peninsula. He has found, propagated, and distributed germplasm for historic restorations of irises, roses, daffodils, and primroses, among others, and has worked with the Nature Conservancy to preserve native flora.

John Fairey and Carl Schoenfeld of Yucca Do Nursery in Waller, Texas, have introduced into the commercial nursery trade dozens of plants native to Mexico and the Southwestern United States. They have made more than 60 expeditions into the mountains of northeast Mexico, collecting seeds and cuttings for testing at their nursery. They also donate seeds and plants to arboreta and universities across the country.

Michael Hayman could be called the "Accidental Arborist." After a severe storm destroyed hundreds of old trees in his Louisville, Kentucky, suburb, he led a group of volunteers in planting a replacement tree on a traffic island. Soon he was asked by the mayor to organize a replanting program for the entire neighborhood. Through visits to outstanding plantmen, he obtained rare and unusual trees and woody plants. Today there are more than 350 of the finest species and cultivars growing in his "neighborhood arboretum."

**Garden Tours**

- **On Friday**, we will begin our day at the Monsanto Corporation in Chesterfield. We will tour the greenhouses and growth chambers where advances in biotechnology are improving seed, plant, and crop production. Our next stop will be the beautiful Old Watson Country Club for lunch and a lecture by horticultural writer Ann Lovejoy.

- After lunch we will have two hours to explore the Missouri Botanical Garden, the oldest botanical garden in the country. We will be on our own to tour and enjoy. Trams are available, but will not be reserved for our exclusive use. There will be lots of walking; comfortable shoes are a must!

- At 4 p.m., join us for tea in the Spink Pavilion with our honored guests, the board of directors of the American Association of Botanic Gardens and Arboreta. Buses will return us to the hotel by 5:30 p.m., and you will have the evening free to explore the many attractions St. Louis has to offer.

- **On Saturday**, we will depart for the Ladue section west of the city to tour five outstanding private gardens, including a prairie with native Missouri grasses and plants, an English garden setting that features a naturalized swimming pool, and a garden selected by the Smithsonian as a definitive 20th-century garden.

- Our tour will conclude with dinner at the Ritz-Carlton Hotel in Clayton. A new "Gardeners' Forum"—an exchange of ideas among members and invited guests—will round out the evening, led by AHS Board member Gene Miller.

**Optional Offerings**

- **On Thursday**, buses will depart from the Hyatt Regency Union Station at 1 p.m. for garden tours in and around St. Louis. Among the gardens we will visit are a small, formal in-town garden, a private Japanese garden, and a "condo" garden that features clever use of space. We will return to the hotel by 5:30 p.m. The cost is $75 per person.

- **On Friday**, the Opera Theatre of St. Louis, celebrating 20 seasons of international acclaim, will be performing *The Barber of Seville* (in English), Rossini's boisterous comedy that is a hit in opera houses all over the world. We will take a limited number by bus to the show at 6 p.m. Price of $100 per person includes opera tickets, box supper, and bus transportation to and from the show.

- **On Sunday**, join us for a visit to see four private gardens including a shade garden "naturescape" with specimen American elms, a new but elaborate wooded garden, and one of the oldest homes in St. Louis with exquisite perennial borders on a small-scale lot. Lunch will be served at the Women's Exchange in Ladue, which houses a boutique of unusual handmade items that will be opened just for us. We will leave the hotel at 10:30 a.m. and return by 5:30 p.m. The cost is $90 per person.
**REGISTRATION FEE**
Full registration fee covers all daily programs as listed, registration materials, breakfast and lunch on Friday and Saturday, dinner on Thursday (Awards Banquet and Reception) and Saturday, and ground transportation for tours. Not included are hotel, airfare, personal expenses, or optional tours.

**CANCELLATIONS**
A full refund, less $50 for booking expenses, will be made if written cancellation is received by May 10. No refunds will be made after May 10.

**HOTEL**
Our headquarters hotel is the Hyatt Regency St. Louis at Union Station, One St. Louis Union Station, St. Louis, MO 63103; (314) 231-1234 or (800) 233-1234, FAX (314) 923-3971.
Rates for American Horticultural Society members are $99 per single, $109 per double. Be sure to mention that you are with the American Horticultural Society and book no later than May 1 to receive the special meeting rate.

The hotel is part of the historic landmark Union Station, a recently restored example of Romanesque architecture.

**ST. LOUIS ATTRACTIONS**
Along the banks of the Mississippi River stands the magnificent Gateway Arch—a reminder of early St. Louis' status as the nation's western gateway. Under the arch is the Museum of Westward Expansion, with displays representing the diverse cultures that shaped the American West. Riverboats still line the waterfront and offer dining and gaming opportunities. Laclede's Landing has restaurants and clubs where top jazz artists perform. Union Station, site of our headquarters hotel, offers more than 120 shops, restaurants, and an indoor lake where paddleboats can be rented.

**ABOUT OUR COVER**
The artwork on our program cover was created by St. Louis native Mary Engelbreit. Her richly detailed, warm, and witty designs can be found on products ranging from greeting cards to gifts, stationery, books, and home furnishings. The designs often incorporate horticultural elements—gardens, flowers, trees, garden tools, and gardeners. There are currently five Mary Engelbreit's retail stores with more planned for cities across the country. The American Horticultural Society is grateful to Mary Engelbreit for donating the use of her charming artwork for our cover.

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**AHS ANNUAL MEETING REGISTRATION FORM**
*Register early! 10% discount for registrations postmarked before March 29.*

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<tr>
<th>Full Registration</th>
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**OR SINGLE DAY REGISTRATION**

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**Nonmembers must add annual dues of $45 per household**

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<td>President's Council Membership</td>
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Please make check payable to American Horticultural Society and return with this form to: AHS Annual Meeting, 7931 East Boulevard Drive, Alexandria, VA 22308-1300. For more information, call (800) 777-7931.

299. *Rosa rugosa*. Mix of rugosa or salt spray rose selections. Height: 3-8 feet. A mixture of seeds from plants with double and semidouble white, pink, and magenta flowers. A sturdy shrub with upright stems, native to eastern Asia. Produces fragrant flowers on new wood from late spring to fall; bright red hips form in late fall against dark green foliage. Tough plant useful for slopes and harsh conditions, including seashores, but can spread into natural areas. Cold treat. Zone 2-7.

300. *R. rugosa ‘Alba*. Rugosa or salt spray rose cultivar. Height: 6-8 feet. Similar to species but with single white flowers. For culture, see *R. rugosa*. Zone 2-7.

301. *R. rugosa ‘Rubra*. Rugosa or salt spray rose cultivar. Height: 6-8 feet. Similar to species but with single magenta flowers. For culture, see *R. rugosa*. Zone 2-7.


304. *Stewartia pseudocamellia*. Silky stewartia. Height: 10-18 feet. A native of the Southeastern coastal plain, silky stewartia ranges from a large shrub to a small tree. Large white flowers with purple to blue centers bloom in late summer. Zone 3-10.

305. *S. ovata* cultivars. Mix of seeds from mountain stewartia cultivars 'Red Rose', 'White Satin', and 'Royal Purple'. Height: 10-15 feet. A dense, upright tree with generally pyramidal form. Ideal as a small ornamental. Large flattened red, white, or purple flowers with yellow stamens in the center open in July. Dark green leaves turn red and purplish in fall. A small, rounded tree with distinctive, low, wide-spreading branches. Leaves are pointed ovals. Pink, bell-shaped flowers are borne on a pendulous stalk in May and June. Prefers a sheltered site in full or part sun and moist, neutral to acid soil. Difficult to germinate. Warm treat, cold treat, then repeat the cycle. Zone 5-8.

306. *Symphoricarpos japonicus* 'Pink Chimes'. Japanese snowbell cultivar. Height: 20-30 feet with an equal or greater spread. A small, rounded tree with distinctive, low, wide-spreading branches. Leaves are pointed ovals. Pink, bell-shaped flowers are borne on a pendulous stalk in May and June. Prefers a sheltered site in full or part sun and moist, neutral to acid soil. Difficult to germinate. Warm treat, cold treat, then repeat the cycle. Zone 5-8.


311. *Anemone coronaria*. Anemone. Height: 4 feet. A perennial bergenia, and is more resistant to bolting. For culture, see species.


313. *Anethum graveolens* 'Mammoth'. Dill cultivar. Height: 2-3 feet. Fast-growing annual with large yellow heads and feathery greenish blue leaves. The entire plant is aromatic. Indispensable for salads, sauces, soups, and fish. Sow in warm soil.

314. *Angelica archangelica*. Angelica. Height: to 5 feet. Biennial. Umbels of small greenish white flowers appear in midsummer. The large, 3-part leaves can be cooked as a vegetable. Young stems and petioles are sometimes candied. Prefers moist soils and cool temperatures. Will tolerate some shade. Sow outdoors in late fall or indoors after refrigerating seed for 6-8 weeks. Zone 4-10.

315. *Angelica sp*. Angelica. Donor source of species. Height: 31/2 feet. Long stalks bear compound leaves and clusters of small white flowers on umbels. This biennial usually dies after producing a crop of seeds, but its life may be extended by harvesting flower stalks before seeds are produced. Stems are candied and the leaves used as greens. For culture, see A. archangelica. Zone 4-10.

316. *Anthriscus cerefolium*. Chervil. Height: 1-2 feet. A hardy annual or biennial with light green, parsley-like leaves and tiny white flowers in clusters. Has a flavor similar to parsley but with a touch of licorice. Used in salads, soups, stews, and in combination with other spices. Plant seeds outdoors in spring.


319. *Cynara cardunculus*. Artichoke. Height: 5-8 feet. A thistlelike artichoke relative with spiny gray-green leaves, white hairy beneath, and purple flowers. Young leaves and stalks are edible when blanched. Zone 6-10.

320. *Foemina vulgaris*. Fennel. Height: 1-2 feet. Perennial or biennial usually grown as a biennial. Upright, feathery-gray foliage in large umbels of yellow-green flowers. These should be removed as they fade to prevent self-seeding. Fennel is considered invasive in Virginia and California. Licorice-flavored seeds are used in cooking. Stalks are usually eaten blanched.

321. *F. vulgare* ‘Purpurascens’. Bronze fennel cultivar. Height: to 4 feet. Stems and leaves of this cultivar are washed maroon in early growth and turn bronze-green as the plants mature. For culture, see species.


323. *F. vulgare var. azoricum* ‘Zeta Fino’. Florence fennel cultivar. Has a smaller bulb than the species and is more resistant to bolting. For culture, see species.


336. Levisticum officinale. Lovage. Height: 2-6 feet. A perennial reminiscent of celery but with a stronger flavor. Fibrous fleshy stalks are topped with serrated gray-green foliage. Small creamy flowers yield seeds that can be used like celery seed. Stalks and foliage are used in soups, stews, and raw in salads. Needs soil moist. Can be sown outdoors in the fall. Zone 3-8.

SAVE THIS CATALOG!

337. Matricaria recutita. German chamomile, sweet false chamomile. Height: to 2 feet. This clump-forming annual, native to Europe and Asia, has feathery foliage and inch-wide, daisy-like flowers. It shares both the appearance and some of the medicinal and herbal properties attributed to perennial chamomile (Chamaemelum nobile). A soothing tea is made from the flowers.


339. Abelmoschus esculentus. 'Clemson Spineless'. Okra. This easy-to-grow cultivar takes 55 to 65 days to maturity. Can be started indoors, or sown outdoors after last frost when ground warms up.

340. Allium cepa 'Fino Verde'. Italian basil cultivar. Height: 1-2 feet. Annual. Similar to species with smaller, more prolific leaves. For culture, see species.


342. Atriplex hortensis. Spinach mustard. Height: 1/2 foot. Biennial used as an annual. Dark green leaves are only slightly curvy and have a stronger flavor than common parsley. Prefers part shade. Sow seeds in lukewarm water for 24 hours before sowing. Zone 3-9.

343. A. graveolens. 'California Wonder'. Sweet bell pepper cultivar. Yields sweet, round, green bell peppers. Matures in 50-60 days. Can be used as a winter crop south of Zone 7.

344. B. nigra. Siberian kale. Height: to 3 feet. Upright plant with frilly, reddish purple veined leaves and yellow-orange flowers. Matures in 50 days. Can be used as a winter crop south of Zone 6.

345. B. oleracea. Flowering kale, ornamental kale. Height: 10-15 inches. This attractive plant does double duty as an ornamental for the border and as a vegetable. Blue-green leaves form a rosette above a short stalk. Center leaves are tinged with pink or purple. Color intensifies with cooler weather in fall. Leaves are edible at any time, but are more flavorful when young. Start seed indoors in late winter and transplant outdoors after hardening off, or sow seeds in midsummer for fall crop. Does not tolerate hot summers well.

346. Capsicum annuum. Sweet bell pepper. Height: 2-21/2 feet. An heirloom Italian bell pepper variety grown by a Washington State family for more than four generations, known as "Figaro Sweet Italian Pimento." The flattened, scalloped fruits ripen to a deep crimson. The sweet, crunchy peppers are ideal for eating fresh. Start seed indoors and set outdoors when nighttime temperatures are above 50 degrees.

347. C. annuum 'Jigsaw'. Hot pepper cultivar. Height: 11/2 feet. A shrubby, open-pollinated ornamental pepper with purple-and-white foliage and small hot peppers. Start indoors and set outdoors when nighttime temperatures are above 50 degrees.

348. C. annuum 'Super Chili'. Chili pepper cultivar. Shrubby plant bears 3/8-inch, very hot, cone-shaped peppers that start out green and ripen to bright red. Good for salsa or cooking. Matures in 120 days. Because it’s so decorative, this pepper is often grown in containers and brought indoors before frost. Needs plenty of moisture. Sow in warm soil.

349. C. annuum 'Yellow Belle'. Pepper cultivar. An early pepper with bright yellow skin that ripens to bright red. Matures in 65 days. Start indoors and set outdoors when nighttime temperatures are above 50 degrees.

350. C. melo 'Alaska'. Melon cultivar. Fast-maturing melon grown for northern gardens. Fruits have creamy yellow netted skin that turns reddish orange when ripe. Apricot-colored flesh is moist and sweet. Matures in 70 days. Start indoors in peat pots, or sow outdoors when soil reaches 60 degrees.

351. C. melo 'Green Nutmeg'. Melon. Extra-early, slightly oval melon with ribbed, heavy, net-
red skin. Super-sweet flesh is light green with salmon-colored center. Matures in 62 days. Sow outdoors when soil gets warm. If sowing indoors, use peat pots to minimize transplant shock.

356. C. melo 'Iroquois'. Iroquois muskmelon. A classic orange-fleshed melon with delicious flavor that can attain a weight of 3-4 pounds. Adapted for growth in northern gardens. Matures in 90-120 days. Start indoors in peat pots, or sow outdoors when soil reaches 60 degrees.

357. C. sativus 'Orient Express'. An Asian variety of slicing cucumber with dark green fruits that average 10 inches long and an inch thick. Small seed cavity and mild taste. Vines grow to 8 feet. Disease resistant. Matures in 64 days. Can be started indoors in peat pots or sown outdoors after danger of frost has passed.

358. C. sativus 'Slice Master'. Slice master cucumber. A smooth, mild-flavored, dark green cucumber with white markings. Matures in 55 days and produces a heavy yield. Sow 1 inch deep outdoors when soil warms up. Keep soil evenly moist during germination.


360. Cucurbita maxima. Spaghetti squash. This yellow-skinned winter squash has orange-yellow fibrous flesh that when cooked resembles strands of spaghetti. Sow seeds in mounds at least 4 feet apart after danger of frost has passed.

361. C. maxima. Boston marrow squash. An heirloom variety from Old Starbridge Village in Starbridge, Massachusetts, this orange-to-red-fleshed winter squash grows to 12-14 pounds. Does best in loamy or sandy soil. Plant outdoors after soil warms, or start indoors in peat pots and transplant in spring. Plant in mounds at least 4 feet apart.

362. C. maxima 'Rouge Vif d'Etampes'. Pumpkin cultivar. A gourmet French cultivar that produces decorative orange-red pumpkins about 6 inches high and 18 inches in diameter with bumpy, shiny skin and narrow, deep-ribbed sections. Matures in 100-120 days. Sow outdoors after danger of frost has passed.

363. C. pepo. Turner Family Original pumpkin. An heirloom variety raised by a family's garden in western Pennsylvania for more than 100 years. Produces sweet-fleshed, slightly flattened pie pumpkins that weigh 5-10 pounds. Dark orange ribbed pumpkin with a hard rind that keeps well through the winter. Vines are vigorous and produce large fruit. Matures in 100-120 days. Can be sown outdoors in long growing season; otherwise, start indoors in peat pots.

364. C. pepo 'Delicata'. Winter squash cultivar. A round tan squash with a dark green stripe. Squash weight up to 1/2 pounds with a color and flavor reminiscent of sweet potato. Matures in 95 days. Sow seeds in mounds after danger of frost has passed.

365. C. pepo 'Jack o' Lantern'. Pumpkin cultivar. Delicious in pies and breads. Seeds make tasty snack. Matures in 100-110 days. After soil warms up, sow outdoors in mounds 3-4 feet apart.

366. C. pepo 'Table Ace'. Winter squash cultivar. Vigorous, compact plants set heavy crops of dark green, acorn-shaped squashes with bright orange flesh. Matures in 75 days. Sow in mounds 3 feet apart.

367. Cucurbita sp. 'All Seasons'. Hybrid bush squash. Height: 3 feet. Compact, upright bush bears 5-8 fruits that can be harvested young and cooked like summer squash, or allowed to mature for winter use. Somewhat oval, bright orange fruits have mild nutty flavor and can weigh up to 3 pounds. Matures in 90 days.

368. Dauces carota var. sativa 'Fly Away'. Carrot cultivar. A new hybrid carrot bred for resistance to carrot flies. These medium-long 'Nantes' type carrots have excellent flavor. Matures in 72 days. Needs rich, well-worked soil. Several sowings can be made to prolong the bearing season. Seedlings should be thinned to 2 inches apart. Soil should be mounded slightly around the crown to prevent the carrot tops from turning green.

369. Eruca sativa. Arugula, salad roquette. A leafy lettuce-like plant popular for the spicy, peppery flavor of its leaves, which perk up salads or sandwiches. Matures in 80 days. Sow snap seeds in early spring as soon as the ground can be worked and reseed every two weeks to ensure an ongoing supply. Tends to bolt in heat of summer, but start sowing again in late summer for fall crop.

370. Lactuca sativa 'Green Towers'. Romaine lettuce cultivar. Height: 12 inches. Large, full-bodied heads of green leaves. Matures in 74 days. Lettuces require a moist, sandy loam and prefer cooler temperatures. They are often resown in late summer for fall crops. In the South they can be grown as winter crops. Do not cover seeds.

371. L. sativa 'Merveille des Quatre Saisons'. Lettuce variety. French Bibb-type lettuce produces reddish leaves with cranberry-colored tips and a pale green heart. Matures in 60-70 days. Part shade in hot weather will reduce bolting. Prefers well-aerated, loamy soil. For culture, see L. sativa 'Green Towers'.

372. L. sativa 'Salad Bowl'. Lettuce cultivar. A loose-leaf lettuce with a slightly sweet flavor and crisp texture. Matures in 45-50 days. For culture, see L. sativa 'Green Towers'.

373. L. sativa var. 'Valmaine Cos'. Romaine lettuce cultivar. Ideal salad lettuce with an 8-inch upright head. Outside leaves are dark green and interior leaves are pale and crisp. Matures in 78 days. For culture, see L. sativa 'Green Towers'.

374. Lagenaria siceraria. Hard-shell gourds. A mixture of hard-shell gourds, including dipper gourds and spoon gourds; that have a long, narrow "handle" attached to a globular base. Matures in 90-120 days. Plant outdoors after soil warms, or start indoors in peat pots and transplant in spring. Plant in mounds at least 5-8 feet apart. Gourds can be grown on trellises.

375. Lepidium sativum. Garden cress. An unusual but tasty salad green with light green, ruffled, parsley-like leaves that have a clean, peppery tang. Matures in 25 days. Cool-season crop. Sow seeds outdoors as early as soil can be worked and resow at two-week intervals until weather gets hot. Begin resowing in late summer for fall crop.

376. Luffa sp. Luffa, dishcloth gourd. Vigorous, nonwoody vine to 15 feet. Young gourds may be cooked like squash, but mature 12-18 inches long gourds can be harvested as sponges. Matures in 110 days. Sow outdoors after danger of frost has passed.

377. Lycopersicon hirsutissimum 'Husky Cherry Red'. Cherry tomato cultivar. Height: 4 feet. An early cherry tomato that produces 1-inch red fruits in 65 days.

378. L. hirsutissimum 'Mamma Mia'. Tomato cultivar. A new disease-resistant and high-yielding cultivar that is delicious fresh and an exceptionally good meaty tomato for making sauces. Pear-shaped fruits mature in about 62 days.


380. Phaseolus vulgaris. Scarlet runner bean. Long, twining vines produce bright scarlet flowers and can be trained up trellises or other structures. Beans can be picked immature as string beans or fully mature as shell beans. Matures in 65 days. Requires a loamy soil. Sow 1 inch deep at 6-inch intervals after danger of frost has passed. Pass water at the base of the plant to prevent mildew from attacking the leaves.

381. P. vulgaris 'Jacob's Cattle'. Bush bean heirloom cultivar. High-yielding, low-growing bush beans produce creamy white beans speckled with red. Dry beans are used for baking and in soups; picked young they can be eaten like green beans. Matures in 85 days.

382. P. vulgaris 'Louisiana Purple Pod'. Snap pea bean cultivar. Gorgeous purple flowers and Pods, yielding large quantities of light brown beans. Delicious raw or cooked. Matures in 70 days. This bean is often trained up corn stalks.
383. *P. vulgaris* ‘Selma Zebra’. Pole bean cultivar. Height: to 6 feet. An early snap bean that produces medium-size green pods striped with purple that turn completely green when cooked. Beans are light brown with black stripes. A vigorous climber that requires staking. Matures in 65–75 days. Easy to germinate either outdoors after frost or indoors in peat pots.

384. *P. vulgaris* ‘White Greasy Grit’. Snap pole bean cultivar. Height: to 10 feet. Fast-growing vine produces a heavy load of 6-inch pods tightly packed with white beans. These have a nutty flavor and can be used either as snap or dry beans. Matures in 80 days. Definitely needs staking.


386. *Pisum sativum* var. *macrocarpon*. Sugar snap pea. Winner of the All-America Selections gold medal in 1979. The entire pod can be eaten after rising and is delicious, tender, and crisp when young. Matures in 70 days.

387. *P. sativum* var. *macrocarpon* ‘Dwarf Green Sugar Pea’. Pole cultivar. 2- to 3-inch pods on 3-foot vines. Pods should be picked before they swell. Matures in 65 days. Peas do best in a cool, moist climate. Stagger plantings at 2-week intervals from last frost through early summer.

388. *P. sativum* var. *sativum* ‘Little Marvel’. Pea cultivar. Height: 15–20 inches. Fresh peas have sweet delicate flavor and may be frozen or canned. Matures in 55–70 days.

389. *P. sativum* var. *sativum* ‘Wando’. ‘Petit pois’ pea cultivar. Small pea pods are filled with tiny super sweet peas that are excellent eaten fresh, or canned or frozen. Growth can be stimulated by use of trellises or stakes. Matures in 55–65 days.

390. *P. sativum* var. *sativum* ‘Waverex’. Pole cultivar. A high-yielding pea variety that produces medium-large, dark green peas. Growth can be stimulated by use of trellises or stakes. Matures in 70 days.


392. *R. sativus*. White radish variety. Donor assures of variety. Tubelike white roots can be used as a garnish or eaten fresh. Matures in 30 days. Seeds should be sown outdoors and staggered for continuous harvest.


395. *R. sativus* ‘Sparkler White Top’. Radish cultivar. Easy, fast-growing radish that matures in 20–30 days. Prefers soil that is consistently moist but not waterlogged. sow seeds 1/2 inch deep outdoors in late winter through mid-spring and then again beginning in late summer.

396. *Rheum rhabarbarum* ‘Victoria’. Rhubarb. Height: 2–3 feet. Rhubarb is a perennial that grows in clumps of ruffled red or green leaves held on celery-like stalks. The stalks are edible and are commonly used to make jellies and pies. The leaves are poisonous and should not be eaten. This cultivar has deep red stalks. Rhubarb is a cold-season crop that requires at least two months of cold weather to mature. It takes about two years to get a crop from seed. Sow seed indoors in late winter and transplant outdoors after hardening off in early spring.

397. *Brassica oleracea*. Mixed cabbage varieties. A mix of 10 cabbage varieties, including early, late, round, flat, red, and green types. Require part shade in hot climates and moist soil. Will bolt during hot weather. Start seed indoors, then harden off and transplant outdoors around last frost date.


399. Jung’s Salad Blend. A combination of ‘Prizehead’ and ‘Plato II’ lettuces, kale, endive, rhubarb, Swiss chard, and mustard. Described as a complete salad in a single packet. For culture, see directions for similar varieties.

400. General Purpose Mix. This mixture of annuals, biennials, and perennials is designed to suit all hardiness zones in the lower 48 states. At least 6 hours of sun are necessary. Included are baby’s breath (Gypsophila paniculata), black-eyed Susan (Rudbeckia sp.), catchfly (Silene sp.), parsley (Petroselinum crispum), and others.

401. Midwest Mixture. A mix of annual, perennial, and biennial wildflowers for Illinois, Indiana, Iowa, eastern Kansas, Kentucky, Michigan, Minnesota, Missouri, eastern Nebraska, Ohio, Wisconsin, southern Manitoba, and Ontario. Included are aster (Aster spp.), bachelor’s button (Centaurea cyanus), lance-leafed coreopsis, clematis, dame’s rocket (Hesperis matronalis), candytuft (Iberis umbellata), scarlet-flowering flax (Linum grandiflorum ‘Rubrum’), dwarf evening primrose, purpe prairie clover (Petasites serpens purpureus), and others.

402. Southwest Mix. A mix of wildflowers suitable for Arizona, Southern California, southern Nevada, and New Mexico. Included are Tabebuia daisy (Macroptera tansyfolia), farewell-to-spring (Clarkia unguiculata), cornflower (Centaurea sp.), prairie flax (Linum perenne subsp. levisii), flowering flax (Linum grandiflorum), penstemon (Penstemon strictus), Callfornia poppy, corn poppy, tidy-tips (Layia platyglossa), yarrow (Achillea spp.), and others.

403. Caryota sp. Fishtail palm. Height: 4–50 feet. Tropical palm tree that cannot be grown outdoors north of Zone 10. Height is variable depending on location. Typically gets solitary trunk with triangular, fishtail-shaped compound leaves. Flowers only once, after many years of growth. Tolerates part shade. Prefers soil that is an equal mix of peat and sand. Will not tolerate sustained temperatures below 60 degrees.

404. Mimosa pudica. Sensitive plant, mimosa. Height: 2–3 feet. A small, shrubby plant with pinnately compound leaves formed of 12 to 25 pairs of tiny oblong leaflets. The leaves close up and jointed stems fold when the plant is touched. Exotic-looking pink to lilac flower heads bloom on upright stalks. This native of the American tropics has become widely naturalized in tropical areas worldwide. Not hardy north of Zone 9, it can be grown in the greenhouse or as a house plant, or can be used as an uncommon annual in the border.

405. Puya mirabilis. Puya. Height: 18–24 inches. A member of the bromeliad family with evergreen, swordlike, spiny margined leaves that form a basal rosette. White to green bell-shaped flowers bloom from leafy stalks that grow from the center of the leaves. Tolerates poor, rocky soils and dry conditions. Native to South America, this plant is useful for rock gardening south of Zone 10, or can be grown in a greenhouse. Sow in soilless mix. Do not cover seeds.
ORDERING INFORMATION

HOW TO ORDER

• List selections by number only.
• Attach the mailing label from this issue or fill in your name, address, and member number from the top left-hand corner of the mailing label. Your order will be shipped faster if you include your member number on the order form.
• In case our supply of your first-choice seed packets has been depleted, please be sure to list substitute selections in the space provided on the order form.
• To increase your chances of getting your first-choice selections, please mail us your order form as soon as possible.
• The deadline for ordering seeds is May 1, 1996. Orders postmarked after that date will not be filled.
• Keep this catalog! You will need it to identify the seeds you receive. Seed packets are identified only with the numbers that appear in this catalog. Replacement copies of the catalog are $3 each.

VOLUNTARY CONTRIBUTIONS

While seeds offered in this annual exchange are free to our members, we do request a voluntary contribution to help defray postage and handling costs. We request a minimum of $3 if you are ordering 10 packets of seeds, and $4 if you are ordering 15 packets of seeds.

BONUS SEEDS

Additional contributions to the Seed Exchange Program help support student interns who assist with coordinating it. These funds also allow us to mail surplus seeds to schools and other nonprofit groups. Members who donate $10 or more to the Seed Exchange Program when they order will receive four bonus seed varieties as a thank-you. This year’s bonus seeds, from Harris Seeds and The Fragrant Path, are:

• *Tagetes patula* ‘Royal King’. French marigold cultivar. Height: 14 inches. A vigorous marigold that produces abundant yellow and red flowers up to 3 inches in diameter. Excellent for the middle of the summer border.
• *Lycopersicon lycopersicum* ‘Prime- time’. Tomato hybrid. A superior late-season tomato with large, smooth fruit. Forms a large vine that does best with support. Start indoors and transplant. Matures in 84 days.

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☐ Please send me 10 selections. I enclose my $3 voluntary contribution.
☐ Please send me 15 selections. I enclose my $4 voluntary contribution.
☐ Please send me my four bonus seeds. I have enclosed a donation of $____ (a total of $10 or more) to help AHS continue to offer and improve its Seed Exchange Program.

MAIL TO: AHS Seed Exchange Program
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* Salt Spring Seeds, P.O. Box 33, Ganges, British Columbia V0S 1E0, Canada. Catalog $2.
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From Seed to Bloom
Eileen Powell
Book code: TIM 195
This one-stop reference provides instructions on how to grow more than 500 annuals, perennials, and herbs. The individual plant entries include information on hardiness, sowing, germination, and light and soil requirements. Contains line drawings, a glossary, and a source list. 1995. 320 pages.

Garden Flowers from Seed
Christopher Lloyd and Graham Rice
Softcover. Retail price: $19.95. AHS price: $17.75.
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A dialog between two famous and opinionated garden experts who offer valuable advice on which seed-raised flowers to grow, how to germinate and tend them, and how to best use them in the garden. 1994. 310 pages.

The New Seed Starters Handbook
Nancy Bubel
Book code: ROD 188
A complete guide to propagating more than 200 vegetables, fruits, wildflowers, trees, and shrubs, as well as garden flowers. It includes a section on saving seeds and on ordering from seed banks, exchanges, and catalogs. Contains photographs, line drawings, resource lists, and a glossary. 1988. 400 pages.

Saving Seeds
Marc Rogers
Book code: GAR 010
All you need to know about how to raise, harvest, and store seeds for the easiest-to-grow and most popular vegetables and ornamental plants. The author discusses each vegetable and flower in detail and answers hundreds of gardening questions. 1992. 185 pages.

Pruning: A Practical Guide
Peter McHoy
Hardcover. Retail price: $30. AHS price: $27.
Book code: ABV 193

The Complete Book of Pruning
Brian Halliwell, John Turpin, and John Wright
Book code: STY 188
This British classic answers the "how" and "when" of pruning for trees, shrubs, climbers, fruit trees, hedges, and greenhouse plants. The text is illustrated with photographs and line drawings that pinpoint correct pruning cuts. 1988. 168 pages.

Rodale's Successful Organic Gardening: Pruning
Kris Medic
Book code: ROD 720
This book includes detailed pruning instructions on more than 120 common trees, shrubs, and vines. There are chapters on pruning for fruit production and pruning all types of roses, as well as tips on pest and disease control. Contains color photographs and easy-to-follow diagrams. 1995. 160 pages.

The Garden In Winter
Rosemary Verey
Book code: TIM 115
This classic book is now available in paperback. In beautiful color photographs and highly readable text, it shows how to plan and plant for maximum effect in winter. Includes a listing of more than 200 plants notable for their cold-season flowers, berries, foliage, or bark. 1995. 168 pages.

The City and Town Gardener
Linda Yang
Book code: RAN 195
New in paperback, this book is a classic on designing for small spaces everywhere. It provides detailed plans and plant lists as well as mail-order sources for plants, tools, furniture, and less common items such as biological controls and soil tests. Contains color photographs and line drawings. 1995. 316 pages.

The Collector's Garden: Designing with Extraordinary Plants
Ken Druse
NEW. Hardcover. Retail price: $45. AHS price: $40.
Book code: CRN 596
In yet another outstanding book, Druse introduces us to the people who created each of the 21 featured gar-
gardeners indulge their particular plant passions and a guide to help locate hard-to-find plants. Illustrated with 400 full-color photographs. Due out March 1996. 256 pages.

REFERENCE

The Native Plant Primer: Trees, Shrubs and Wildflowers for Natural Gardens
Carole Ottesen
NEW. Hardcover. Retail price: $50. AHS price: $45.
Book code: CRN 115
This is a comprehensive, region-by-region guide to selecting and gardening with beautiful, easy-care, ecologically beneficial native North American plants. Includes sources for the plants pictured in the more than 500 color photographs. 1995. 368 pages.

The Year In Trees
Kim Tripp and J.C. Raulston
NEW. Retail price: $44.95. AHS price: $40.
Book code: TNN 959
Two highly respected plant people offer 150 plant portraits of trees and shrubs in each season to help readers select the right ones for their use. The authors are spreading the word about high-quality woody plants that they think “deserve a chance in our gardens.” Includes cultural information and more than 200 color photographs. 1995. 208 pages.

Annuals and Bedding Plants
Nigel Colburn
Book code: TRA 395
This popular British garden writer has a host of suggestions for using even common plants in imaginative ways. He presents a series of schemes illustrated with more than 100 color photographs and described with full plant lists to show how plants can be used to beautiful effect in any type of garden. 1995. 96 pages.

GOOD READS

Deep in the Green
Anne Raver
Book code: KNO 115
A compilation of essays, this delightful book entertains and educates at the same time. An ideal book to curl up with on the couch on long winter evenings. 1995. 280 pages.

Full Bloom: Thoughts from an Opinionated Gardener
Rayford Clayton Reddell
Book code: CRN 936
By the author of The Rose Bible, who is also a gardening columnist for the San Francisco Chronicle, this book is full of colorful anecdotes and invaluable gardening advice. It covers a wide range of topics that gardeners will find useful and conveys a contagious passion for all things growing. Due out March 1996. 224 pages.

Grandmother's Garden: The Old-Fashioned American Garden 1865-1915
May Brawley Hill
NEW. Hardcover. Retail price: $45. AHS price: $40.
Book code: AHR 702
Drawing on primary sources such as letters and contemporary garden writing, this book is the first serious study of traditional American perennial gardens, which attained great popularity in the years between the Civil War and World War I. The gardens of Emily Dickinson and Harriet Beecher Stowe are featured, as are paintings by American Impressionists of their own informal gardens and those of their friends. More than 150 period paintings and photographs—75 in full color—are reproduced. 1995. 240 pages.

The Unsung Season
Sydney Eddison
Hardback. Retail price: $29.95. AHS price: $26.95
Book code: HOU 196
Subtitled “Gardens and Gardening in Winter,” this book introduces the reader to a wonderful community of experts and individualists who expand the spring-to-fall growing season into a year-round pleasure. 1995. 204 pages.

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JANUARY 1996 AHS BOOK CATALOG
FLOWER SHOWS OFFER FREE ADMISSIONS

In the nick of time to rescue gardeners from the winter doldrums, the 1996 flower show season begins with refreshing ideas and practical advice to make next spring's garden perfect. The following flower and garden shows have offered free admission to American Horticultural Society members displaying a current AHS membership card:

Arkansas
The fifth annual Arkansas Flower and Garden Show, February 23 through 25 at the Statehouse Convention Center in Little Rock, promises to be even bigger and better than last year. There will be 12 beautifully landscaped gardens, more than 70 commercial booths with all types of lawn and garden information, children's activities, a flower show, and a professional florists' competition. Holly Shimizu, assistant executive director and chief horticulturist for the U.S. Botanic Garden, will be the keynote speaker; other speakers will be on hand to give informational and entertaining programs. New this year will be hands-on workshops on pruning, propagation, and flower arranging.
Information: (501) 821-4000.

Colorado
The Colorado Garden and Home Show will once again bring promises of spring to the Denver area February 3 through 11 in the Colorado Convention Center. This year's show will inspire gardeners with 13 walk-through theme gardens designed by select Denver-Boulder area landscape contractors and garden designers, featuring 10,000 blooming plants, hundreds of trees and shrubs, waterfalls, and garden structures. Those interested in bringing the garden indoors will be attracted to the interior plant displays featuring sunrooms and atriums and cur-flower displays by professional florists. Advanced gardeners will enjoy the Standard Flower Show presented by the Colorado Federation of Garden Clubs, Inc., and the National Council of State Garden Clubs, while the novice can learn at more than 30 educational seminars on gardening and home improvement.
Information: (303) 696-6100.

Florida
Bringing the best of the outdoors to the indoors, the 52nd annual Miami International Home and Garden Show will be held May 25 through June 2 at the Miami Beach Convention Center. This year's show will feature an International Garden Pavilion with a wealth of information and ideas especially for gardeners in tropical climes. This area will include tropical landscape displays, floral displays, and a marketplace of gardening products and accessories. Visitors will be able to check out the latest techniques and materials for xeriscaping and environmentally friendly pest control, and hear additional tips from leading gardening pros. Exhibitors at this year's show will include landscape architects, garden designers and nurseries, horticultural groups and plant societies, and a wide variety of gardening product and accessory distributors.
Information: (305) 666-3944.

Georgia
AHS members will be given discounted admission at the Southeastern Flower Show February 21 through 25 at the Town Hall Exhibition Center, City Hall East, in midtown Atlanta. The five-day event will encompass nearly four acres, presenting professional landscapes that emphasize artistic considerations as well as plant choices for the South, educational displays, ongoing lectures and demonstrations, a marketplace filled with more than 100 boutiques and shops, a children's activity center, and an opening night preview party.
Information: (404) 888-5638.

Indiana
The Fort Wayne Home and Garden Show will be held in Fort Wayne's Memorial Coliseum, February 28 through March 3. The focus of this year's show will be international gardens, and demonstration gardens will cover 11,700 square feet in the Main Hall. "Polynesia," a central feature, will have a 30-foot waterfall dropping to a small lagoon fringed with white sand and tropical flowers. Palm trees up to 29 feet tall and tropical birds will complete the garden's effect. There will also be gardens representing Japan and the Netherlands, and an English formal garden.
Returning will be many of last year's favorites including Jim Wilson, author and host of "The Victory Garden," and seminars on a wide range of garden topics, including two new ones—bonsai and roses.
Information: (812) 546-1444.

Massachusetts
The New England Spring Flower Show will be celebrating its 125th anniversary at the 1996 show in the Bayside Exposition Center in Boston, March 9 through 17. This year's theme, "Celebration!," will inspire exhibitors to celebrate nature while creating wedding gardens, garden parties, Maypole gardens, and gardens that extol the history of America in and outside of the garden. Highlights of this year's show will include an interior design show, a window box exhibition, and a garden marketplace with more than 250 garden retailers. The show will also have a strong educational component with demonstrations of flower arranging techniques and home garden design; a discovery center devoted to interactive exhibits on environmental and garden-related topics; ongoing lectures and demonstrations by the Massachusetts Horticultural Society; a special exhibit on ecosystems; and the popular horticultural information center with Master Gardeners on hand to answer questions and offer gardening advice.
Information: (617) 536-9280.
GARDENING SOLUTIONS SYMPOSIUM

The American Horticultural Society will co-sponsor a one-day symposium, "Gardening Solutions: Big Ideas for Small Spaces," along with the University of Delaware's Longwood Graduate Program and the Scott Arboretum. The symposium will be March 14 at Swarthmore College in Media, Pennsylvania.

Featured speakers are Bill Barrick, director of Callaway Gardens, Georgia; Richard Evans, Co-operative Extension specialist at the University of California-Davis; Rob McCartney, horticulturist at Sea World, Ohio; Felder Rushing, Mississippi co-author of Passalong Plants; and Holly Shimizu, assistant executive director and chief horticulturist of the U.S. Botanic Garden, Washington, D.C. Speakers will present ideas to maximize use of limited space in gardens. Other topics for discussion will include creating back-yard habitat gardens, building and maintaining healthy soil, incorporating edibles, herbs, and other useful plants into the garden, and container gardening.

Advance registration is required. For more information, call Gerry Zuka at (302) 831-2517.

AHS YOUTH GARDENING SYMPOSIUM '96

Plans are underway for the American Horticultural Society's fourth national youth gardening symposium, June 28-30 at Callaway Gardens in Pine Mountain, Georgia. Entitled "Sowing Seeds and Growing Minds—Cultivating Education in the Garden," this symposium will feature speakers who are implementing innovative programming in schools and botanical gardens, using horticultural knowledge to enrich all areas of the curriculum. Callaway Gardens' education staff will showcase their exceptional children's programs, providing hands-on experience for symposium participants. Educators, horticulturists working with children, and other interested adults are encouraged to attend. For more information, call Helen Phillips at (800) CALLAWAY ext. 5153 or call AHS at (800) 777-7931.

New York

The New York Flower Show returns to Broadway this year with the theme "Broadway in Bloom" March 8 through 17 in the New York Coliseum.

The show's display gardens and floral designs will be organized around the Broadway theme, using the great dramas and musicals of the New York stage as creative inspiration. This year's show will feature about 30 demonstration gardens and landscapes as well as floral displays, educational exhibits, free lectures, and the traditional horticultural and floral design competitions.

Information: (914) 421-3299.

Ohio

The Fifth Third Bank Cincinnati Home and Garden Show will be February 24 through March 3 at the Cincinnati Convention Center.

Some of this year's show highlights will include a relaxation garden by Todd PotterSchmidt, a perennial garden by The Garden Did It, a garden cafe by Patri Daeza, a presentation of an Amdega Conservatory from England by Urban Thickets, Inc., and a Perennial Education Area by Turpin Farms. This show is the Junior League of Cincinnati's biggest fund-raiser of the year and will feature various artisans selling home and garden wares plus a beautiful container garden exhibit by the Junior League.

AHS members should take their current membership cards to the exhibitor registration desk at the 6th and Elm Street lobby for free admission or call (513) 281-0022 for more information.

Oregon

The Portland Home and Garden Show will be February 21 through 25 at the Portland Expo Center.

Last year's landscape competition featuring some of the Northwest's premier landscape designers is being expanded. This designer showcase will inspire visitors as well as give them practical ideas for their home landscapes. The show will also include many demonstrations and seminars for the homeowner on the latest techniques for nongardening skills such as installing windows, insulation, and electrical outlets.

Information: (503) 246-8291.

Rhode Island

The third annual Rhode Island Flower and Garden Show, "The Gateway to Spring," featuring gardens of southern New England, will be February 22 through 25 at the Rhode Island Convention Center in downtown Providence.

Highlights of this year's show will include 27 demonstration gardens, many educational exhibits, a children's activity garden, amateur horticultural and floral design competitions, professional floral designers' displays, and a marketplace featuring 150 vendors of garden-related products. There will also be an extensive seminar program each day of the show.

Information: (401) 421-7811.

Washington

The Tacoma Home and Garden Show will bloom once again January 31 through February 4 in the Tacoma Dome with exhibits, tips, demonstrations, and seminars to help spruce up the yard and shape up the home.

Highlights of this year's show will include two fully landscaped gardens featuring flowers, herbs, and vegetables; a charity auction and dinner; the "Parade of Playhouses"; more than 70 gardening seminars; and 700 exhibits showcasing the latest products and services for home and garden care.

Information: (206) 756-2121.
REGIONAL HAPPENINGS

REMINDER:
There will be no March News Edition so we can bring you the first issue of our 64-page American Gardener in April. We have included here all events through March about which we had information at press time.

Mid-Atlantic

North Central

Northeast

South Central

LADEW BATTLES WOOLLY ADELGID

Last fall Ladew Topiary Gardens in Harford County, Maryland, made its first surrender in a long battle with the hemlock woolly adelgid (Adelges tsugae) by removing a 60-year-old wall of eastern hemlock trees. This 15-foot-high wall surrounding the Croquet Court was planted by the gardens’ first owner, Harvey Ladew, in the 1930s. Impatient to see results, Ladew selected the fast-growing hemlocks not only for this wall but also for most of the topiaries and hedges in the gardens. The loss of this wall is just one step in a long process of replacing embattled hemlocks throughout the gardens.

Eastern hemlocks were a poor choice for the intricate pruning and heavy shearing required to keep topiary in shape, Ladew horticulturists note. When the tips are removed, the tree has great difficulty regenerating from within and acquires a “hollow” look. In addition, in its native habitat the eastern hemlock is a delicate understory plant and does not typically thrive in full sun. Repeated cycles of drought, soil compaction, continual shearing, and infestations of insects such as the red spider mite made the hemlocks additionally susceptible to woolly adelgids, which both suck the trees’ sap and inject lethal spittle.

The most important lesson learned from the decline of the hemlocks at Ladew is that monocultures must be avoided. Eastern hemlocks throughout the garden will be replaced over time with a variety of plants, including many cultivars of yew (Taxus), European hornbeam (Carpinus betulus), Leyland cypress (× Cupressocyparis leylandii), and varieties of boxwood (Buxus) and holly (Ilex). The hemlock wall around the Croquet Court will be replaced with an emerald green variety of arborvitae and two varieties of yew.

There will be no March News Edition so we can bring you the first issue of our 64-page American Gardener in April. We have included here all events through March about which we had information at press time.
STOWE BOTANICAL GARDEN IMPLEMENTS MASTER PLAN

Work began in August on Phase I of the 20-year master plan for the Daniel Stowe Botanical Garden in Belmont, North Carolina. The garden was founded in 1989 by Daniel J. Stowe, a textile manufacturer and a native of Belmont. Stowe donated 450 acres of meadows, woodlands, and lakefront property, as well as a $14 million endowment for the botanical garden.

A 10-acre interim garden features a vast perennial display of more than 300 varieties in a half-acre area. Many of the interim beds were designed by Edith Edelman of the North Carolina State University Arboretum. Other attractions include a four seasons garden, a cottage garden, a 350-variety daylily collection, and a woodland walk trail. Since education is one of the garden’s primary goals, the staff offers ongoing seminars, workshops, and nature hikes, as well as conducting botanical research.

New features will include an 18,000-square-foot visitors pavilion with a reception area, a gift shop, orientation rooms, meeting rooms, and a great hall. There will be nine variety gardens at the completion of Phase I. Added to the four seasons garden and cottage garden will be a perennial border, a canal garden, and annual gardens. They will range in style and size from a small garden in a secluded spot near the visitors pavilion to an east lawn garden with a two-acre expanse of colorfully landscaped turf. A tiered-lawn amphitheater will seat 2,500 people for garden events and other entertainment.

Phase I will take more than two years to complete and cost $14 million.

The Daniel Stowe Botanical Garden, at 6500 South New Hope Road in Belmont, is open from 9 a.m. to 5 p.m., Monday through Saturday. For more information, call (704) 825-4490.

CONSTRUCTION SPREADING OAK WILT

Suburban expansion into wooded areas is dramatically increasing cases of oak wilt disease, a fungal disease that is causing millions of dollars in damage to red oaks in urban areas east of the Mississippi River.

“This fungal disease called Ceratocystis fagacearum has been a problem in the Illinois area probably for the last 40 years,” explains James Appleby, University of Illinois entomologist. “It can spread in natural oak groves through root systems which graft onto each other. However, an increase has been noticed in the past few years as more homes are built in forested areas around cities. Existing trees in these suburban lots are often wounded by pruning or mechanical damage related to home building, providing sap-feeding beetles with an opportunity to spread the disease.”

The disease-causing fungus produces an odor that attracts insects, especially sap-feeding beetles. The beetles transfer fungal spores to healthy trees when they feed on sap from a fresh wound.

“Most tree deaths occur in early spring or fall. The symptoms progress from the top of the tree. Leaves turn a dull green, then tan, and suddenly drop,” says Appleby. “The amount of time from infection to mortality varies depending on how the disease is transmitted. In many cases it can be the next growing season before the disease is noticeable.”

Not all oaks are equally susceptible. Trees in the red oak group—northern red oak, northern pin oak, and black oak—are particularly vulnerable. However, those in the white oak group—burr oak, swamp white oak, and white oak—are much less susceptible.

Arborists around the country have resorted to quickly removing diseased oaks in an attempt to stop the spread of the disease. They recommend not pruning oaks between April and July when the beetles that carry the fungal disease are most prevalent. Scientists are still testing a fungistat treatment that could be injected into trees to kill the fungus.

The University of Illinois Cooperative Extension Service has released a video and a companion leaflet explaining the disease and how to manage it. To order a copy, send $25 payable to the university to 69NR Mumford Hall, 1301 West Gregory Drive, Urbana, IL 61801, or call (217) 333-2007.
Mark Your Calendars Now for 1996 Flower Shows

- Feb. 1-4. Atlanta Garden and Patio Show. Galleria Center (across from Cumberland Mall on the Cobb Parkway), Atlanta, Georgia. Information: (404) 998-9800.
- Feb. 2-4. St. Louis Flower Show. Cervantes Convention Center at America’s Center, St. Louis, Missouri. Information: (314) 569-3117.
- Feb. 21-25. Southeastern Flower Show. Town Hall Exhibition Center in City Hall East, Atlanta, Georgia. Information: (404) 888-5638.
- Mar. 6-10. FloralScape '96. Cleveland Convention Center, Cleveland, Ohio. Information: (216) 721-1695.
- Apr. 12-14. PEBBLE Beach Garden Design Show. The Lodge at Pebble Beach, 3rd Fairway of Pebble Beach Golf Links, Pebble Beach, California. Information: (408) 649-2799.

Ahs Co-Sponsoring Indiana Event

An educational symposium, “Harvesting Harmony: Kids, Plants and Animals Growing Together,” will be held May 2 at Orchard Country Day School in Indianapolis, Indiana. Activities include half-day work sessions with national and local experts and keynote speaker Craig Tufts of the National Wildlife Federation. The symposium is co-sponsored by the American Horticultural Society, Orchard in Bloom, and Indy Parks and Recreation. The cost is $55. For more information, call Kate Appel at (317) 255-0474.

Ornamental Grasses for Cold Climes

Minnesota Extension Service bulletin, “Ornamental Grasses for Cold Climates,” is now available for gardeners to use in selecting winter-hardy ornamental grasses suited to their specific needs and situations. The bulletin summarizes a six-year winter hardiness study of 163 ornamental grasses at the University of Minnesota Landscape Arboretum. It features 20 color photographs and 26 illustrations of ornamental grasses, a special section on the Miscanthus genus, and a color map of USDA plant hardiness zones. Also included is a list of mail-order nurseries that sell ornamental grasses.

The 28-page bulletin costs $6 plus shipping and is available from county offices of the Minnesota Extension Service. Credit card orders can be placed by calling (800) 876-8636 or (612) 624-4900; ask for item BU-6411 NR.

**SUBJECT**


Coneflowers: “Elixir of Echinacea,” June, 16.


Dieramas: “Discovering Dieramas,” June, 43.


Scadoxus: “Scintillating Scadoxus,” Aug., 44.


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**Biodiversity in the Orchard**

Researchers with the U.S. Department of Agriculture’s Agricultural Research Service (ARS) are taking a two-pronged approach to increasing the use of integrated pest management in orchards: planting cover crops at the base of fruit trees and interplanting different types of fruit. Just as in designing a wildlife garden, the goal is creating a more diverse ecosystem.

At the ARS Fruit Research Station in Kearneysville, West Virginia, entomologist Mark Brown planted a two-acre orchard with apples. In alternate rows, he planted cover crops of rape, buckwheat, dill, and dwarf sorghum, leaving only about a foot and a half of open space around the trunks. The traditional approach is to leave up to 10 feet of bare soil, so that fruit trees won’t have to compete with grass and weeds for nutrients.

Rape is toxic to harmful nematodes. Dill and buckwheat are long-season producers of flowers that attract beneficial insects, one of which feeds on the codling moth, one of the apple’s most serious pests. And dwarf sorghum attracts aphids, which serve as food for beneficials such as ladybird beetles. “The cover crops allowed more diverse habitats for beneficial insects to rest and mate,” says Brown. “This is a holistic approach to orchard management.” Instead of a harsh chemical spray normally used on apples, the ARS uses sprays of the microbial pesticide Bacillus thuringiensis. A first-year evaluation found that insect and disease problems were no greater on this crop than on a chemically treated control crop. Brown concluded that trees may have been too stressed by the closely planted cover crops, and will next try planting them five to six feet from the trees.

Chemicals not only leach into ground water, but they upset the orchard’s ecosystem. Brown says that when strong chemical controls are used, the number of both pests and beneficials is reduced, and the pests begin returning sooner, by as much as two weeks.

D. Michael Glenn, an ARS soil scientist in Kearneysville, observes that cover crops also reduce erosion and, by sending out roots that continually die and regenerate, increase microorganisms that degrade pesticides that do get into the soil. While they may slow tree growth, this is seen as a plus as well: Competition from the ground covers reduces vegetative growth that can decrease yield, according to Glenn.

In addition to cover-cropping, the West Virginia researchers are interplanting peaches with the apples, a measure that offers two benefits: Host-specific pests find survival more difficult—a codling moth isn’t at home on a peach tree, for instance—and peach flowers, like those of dill and buckwheat, attract beneficials.

**Penstemon Cultivar “Plant of the Year”**

'Husker Red' penstemon (*Penstemon digitalis* 'Husker Red') has been named Perennial Plant of the Year for 1996 by the Perennial Plant Association. The species is native from Maine to the central United States and as far south as Texas. 'Husker Red' was selected in 1983 by horticulturist Dale Lingren and named to honor the University of Nebraska, where he works.

The name also relates to the color of the plant’s foliage, a burgundy or bronze-red. The white flowers appear on the 30-inch-tall perennial in July and August. ‘Husker Red’ prefers slightly acidic soil and performs better in the East than most *Penstemon* species, which are primarily native to our West.

**Will Rotenone Bite the Dust?**

Rotenone, a botanical insecticide that has been used by farmers and gardeners since the 1800s, appears on its way out for use on both ornamental and agricultural plants.

This fall, rotenone producers elected not to proceed with testing to establish food tolerance limits for the product. One of its members estimated that the testing could cost as much as $14 million. Tolerance is the minimum amount of residue allowed by the federal government in or on a raw agricultural product.

According to Chris Lawes, federal registration manager with AgrEvo Environmental Health in Montvale, New Jersey, both rotenone and pyrethrum had until 1988 been exempt from Environmental Protection Agency requirements for the establishment of such tolerance limits because of their botanical origin. Lawes says there are approximately 120 plants that contain rotenone. Historically, the most common source has been plants in the *Derris* genus, primarily from Southeast Asia. More recently, the only commercial source for rotenone used as an insecticide in the United States has been cube—the roots of shrubs in the *Lonchocarpus* genus, collected primarily in Peru. Pyrethrum comes from a chrysanthemum and is an important export of Kenya, among other countries. Rotenone is now labor intensive to collect since the shrub must be harvested by hand in order to obtain its roots, says Lawes.

Cindy Gann, manager of new product development for the Solaris Group, which makes Ortho products, says that Ortho voluntarily cancelled its rotenone registration in October. But they had already sold off their inventory of the product—one percent rotenone mixed with talc in a wettable powder—because it was not profitable enough. Rotenone is sometimes mixed with other active ingredients, including pyrethrum.

Lawes says sale of rotenone as a botanical insecticide—what federal regulators call terrestrial use—was a minor part of AgrEvo’s market as well. It is more popular and profitable as a piscicide. Long used by South American natives to kill fish, it is now purchased by state and federal fish and wildlife service biologists to help eliminate “trash” fish from lakes and streams before restocking them with game fish or reintroducing endangered species. It will still be sold for that purpose, and to control fleas, ticks, lice, and mites on dogs and cats.

Lawes, who gardens as a hobby, comments: “The only loser here is going to be the end user, especially the organic farmer. Rotenone was one of the controls accepted under the organic growing guidelines that the USDA just adopted.”

The botanical origin of a pesticide does not prevent it from being toxic, and rotenone is one of the most toxic on the market—not to most mammals or bees but to many other beneficial insects. Like most botanicals it quickly breaks down into relatively benign compounds, in a week or less in the presence of sunshine. And because they are derived from plants, botanicals are easily broken down by microbes in the soil.

Lawes says some manufacturers may yet try to defend terrestrial uses of rotenone. “It will be an uphill battle, but the nail’s not in the coffin yet.” Nevertheless, he observes that pesticide companies are much less willing to bear such expenses in the case of a botanical because as a natural substance, it can’t be patented as can a synthetic chemical. No one has yet found a way to produce a synthetic version of rotenone, as has been done with pyrethrum.