American Horticulturist

VOL. 68 NO. 9 • NEWS EDITION A PUBLICATION OF THE AMERICAN HORTICULTURAL SOCIETY SEPTEMBER 1989

Revitalizing the Rhizosphere

During the growing season, it's easy to overlook the life that teems beneath our feet. With summer winding down, now is a good time to pause and peer at the rhizosphere—the root zone—and consider taking steps to improve its health.

It's a jungle down there. Not only organisms you can see, such as moles, worms, and grubs, but also microorganisms such as nematodes, protozoa, algae, fungi, and bacteria are reproducing themselves and consuming each other. Along with living and dead roots, they're exuding and taking up chemicals.

David Clark

It's a world that's incredibly complex. "I'd say our knowledge of the area six inches to two feet below the soil's surface is comparable to our knowledge of outer space right now," said Richard W. Zobel, a U.S. Department of Agriculture (USDA) plant geneticist, speaking this summer at a Beltsville, Maryland, meeting on the relationship between plants and the rhizosphere.

Zobel noted that the tools for studying soil physics and chemistry, plant biology and physiology, entomology and microbiology are all fairly new, and that none of them is designed to work with more than a single microorganism or plant at a time. Just as plants differ from each other above the soil, their roots aren't all the same. For instance, some give as much as they take, dying back every two weeks and continually feeding the microorganisms that coexist with them.

Studies of this mysterious realm are teaching us how to manipulate genes to breed plants that are more tolerant of extreme conditions, and how to use nature's own weapons to fight plant pests and diseases. Deborah R. Fravel, a plant pathologist with the USDA's Agricultural Research Service, predicted at the Beltsville meeting that biological controls will never completely replace chemicals, but that they will reduce the amount of chemicals we use. "The idea is that we can enhance what's out there in nature," she said.

As intricate as all these relationships are, the bottom line for the average gardener is fairly simple: add organic matter to the soil as often, and as much, as possible, whether your soil is hardpan or sea sand, to create an environment where all of these organisms can thrive and multipy.

Merely adding organic matter to the soil serves as a biocontrol, said Fravel, because that organic matter feeds the organisms that are already down there.

"We've known for a long time that if we sterilize soil and put in a pathogen, we can kill all the plants just like that," she said. "But in natural soil with the same amount of pathogen added, you won't kill as many plants and you won't kill them as fast. That's because nature already has a very complicated system of checks and balances."

So the time is here. You've harvested the last of the broccoli and cabbage. No time like winter to compost right in the vegetable plot and let all that freezing and thawing stir things up for you. The asters are fading, the bulbs are waiting. The perennials are straying to places where they aren't welcome. It's a great time to divide them and give them a more comfy and acceptable home. And it's cool enough to do some heavy-duty labor without expiring. So in an effort to be inspiring, we offer some tips, some reminders, and some recent research relating to the incredible world we call soil.

AMERICAN HORTICULTURIST

EDITOR: **Kathleen Fisher**
ASSISTANT EDITORS:
Peggy Lytton, Mary Beth Wiesner
EDITORIAL ASSISTANT: **Martha Palermo**
DESIGN DIRECTOR: **Rebecca K. McClimans**
MEMBERSHIP DIRECTOR:
Kathleen B. Amberger
ADVERTISING: **American Horticultural Society Advertising Department**, 80 South Early Street, Alexandria, Virginia 22304. Phone (703) 823-6966.

Address all editorial correspondence to: **The Editor, American Horticulturist, American Horticultural Society, Box 0105, Mount Vernon, Virginia 22121.** AMERICAN HORTICULTURIST, ISSN 0096-4417, is published by the American Horticultural Society, 7931 East Boulevard Drive, Alexandria, Virginia 22308, (703) 768-5700, and is issued six times a year as a magazine and six times a year as a news edition. The American Horticultural Society is a nonprofit organization devoted to excellence in horticulture. Botanical nomenclature in AMERICAN HORTICULTURIST is based on HORTUS THIRD. National membership dues are $30; two years are $55. Foreign dues are $40. $12 of dues are designated for AMERICAN HORTICULTURIST.

Second-class postage paid at Alexandria, Virginia and at additional mailing offices. **Postmaster:** Please send Form 3579 to AMERICAN HORTICULTURIST, Box 0105, Mount Vernon, Virginia 22121.

How Small Is Small?

Eliot Roberts of the Lawn Institute suggests that to get a picture of the vast difference in the size of the mineral particles that constitute soil, you should imagine a medium-sized sand particle being the size of the White House. Proportionately, a silt particle would be the size of a limousine parked at the front door, and a clay particle would be about the size of an orange or apple on the front seat. And here's how small a water molecule is, says Roberts: if you filled one of those two-liter soft drink bottles full of sea water, somehow tagged each water molecule, dumped it back in the ocean and magically stirred so that the tagged water was evenly dispersed throughout the earth's oceans and seas, then dipped another two liters of sea water from anywhere on earth, you would have about 30,000 tagged molecules in your bottle!

Such small particles result in a lot of surface area. A pound of the sand will have 20 square feet, the silt 220, and the clay, 5,500 square feet of surface. The interaction of these surfaces with the chemicals produced by living organisms is what makes the soil a living, dynamic system.

That same pound of soil will also contain about 930 billion microbes:

► Some 910 billion bacteria, which may be as small as a half micron in diameter. (A micron is .001 millimeter.) When bacteria die, they provide the soil with essential nutrients.

► About 20 billion actinomyces. Midway between bacteria and fungi on the evolutionary ladder, these organisms produce spores that give the soil its characteristic good earth odor.

► Approximately 450 million fungi. Some live on dead matter and some are parasitic. Some are harmful, and some, like mycorrhizae (see the July News Edition), are helpful to plants.

► 670 million protozoa. These vary in length from 10 microns to several tenths of a millimeter.

Also in healthy soil, you should expect to find:

► Earthworms. As an earthworm burrows through soil, leaving it behind as a cast, it can increase the nitrogen content by 300 percent, the phosphorus by 600 percent, and the potassium by 1,000 percent.

A common ciliate type of protozoa.

Courtesy Soil Science Society of America

One of our bigger garden allies, the centipede.

The fruiting structure of a *Streptomyces* actinomycetes.

► Arthropods. Mites, millipedes, centipedes, springtails, and fly larvae all feed on decaying plant matter. Some ingest soil and help condition it; others keep it aerated. Beetle larvae, which damage grass roots, do some good as burrowers. Ants and termites are primarily soil movers, although some termites ingest soil and mix it with organic matter.

► Nematodes. There are 14 different classes. Some are friends and some are foes. They may feed on decaying organic matter, small soil animals, or plant roots. The biological processes through which these organisms survive convert organic matter into humus, which in turn helps to shape and stabilize soil aggregates that are important to deep and extensive root growth. Humus also contributes to the process by which soil and plants exchange essential nutrients.

Amending Your Soil's Constitution

Because organic matter needs to decay before it is added to the soil, fall is the time to add it directly to beds. Substances that can be ornery when added fresh—such as manures or highly acidic types of leaves—will have broken down to mild-mannered humus come spring. The heaving earth caused by alternate freezes and thaws that wreaks havoc with roses, shrubs, and perennials in many zones during the winter can work to a gardener's advantage, helping to break down and mix various amendments.

All but the most neophyte gardener can tick off a list of common soil amendments—leaves, wood chips, grass clippings, kitchen scraps, manures, wood ashes, bagged top soils. Some are drawn to the more exotic, such as seaweed and worm castings. But misconceptions about some of them are rampant.

We interviewed several members of the Soil Science Society of America, as well as River Farm's own horticulturists, about some common mistakes and debates.

Algae are the soil's major photosynthetic flora. They thrive primarily near the surface, help colonize and weather rocks, and form and conserve soil.

Courtesy Soil Science Society of America

A scanning electronic micrograph of the cells of a bacteria, *Rhizobium meliloti*, attaching to soil particles through a complex sugar that it synthesizes.

Sans Sand

One piece of gardening advice that has attained the stature of gospel is that sand should be added to clay soils to improve its drainage. Don't do it, every one of our experts said: Take the right amount of clay and fine sand particles and you make—concrete. Your chances are better with coarse sand, but it's still a gamble.

"The problem with sand is that most people don't add enough to change the physical condition of the soil," said Emmett Schulte of the University of Wisconsin-Madison. "The result is that the soil compacts more than it otherwise would." Because the composition of soils varies so much, it's almost impossible for the amateur gardener to know exactly how much sand to add, said Donald Rieke, professor of turf management at Michigan State University.

Similarly, perlite and vermiculite will improve water retention and aeration, but they are fairly expensive additives. Why bother to use them, our experts asked, when organic matter is available for free, will also improve drainage and tilth (the ease with which soil slides through your fingers and tools), and has the added benefit of adding nutrients and providing a haven for soil organisms?

Freebies

The type of organic matter you use is less important than its stage of decay. When fresh twigs and leaves begin to decompose, bacteria will get first dibs on their valuable nitrogen; plants dine last at this table. All organic additives should be chopped up and allowed to decompose for some time before being used as soil amendments. "Yet we all have the neighbor that rototills under about two feet of leaves in the spring," said Rufus Chaney of the USDA's Agricultural Research Service. The result is the formation of anaerobic compounds, the smell of rotten eggs, and the death of plant roots. And Rieke noted that the bulkiness of undecomposed organic matter can also prevent the soil contact needed for fine seeds to germinate.

Much of this concern is eliminated when you add organic matter in the fall.

For instance, gardeners with acid soils are sometimes told that if they use leaves as an amendment, they will further increase soil acidity. But leaves vary a great deal in pH depending on species—for instance, oak and maple are more acidic and ash more basic. Some authorities say growing conditions also affect the pH. All this is academic after decomposition, when the difference is too slight to worry about, said Schulte, although he advises avoiding highly acidic conifer needles around non-acid-loving plants.

Manure is another amendment about which there is a high degree of personal opinion, but most kinds can be added more safely now. Soil scientists say manure has value in terms of both nutrients and fiber, but that like leaves, it will vary in content, depending on the type of animal it came from, its health and diet. Poultry droppings have three times as much nitrogen as manure from dairy cattle and could result in too much vegetative growth; they should be allowed to age even longer than other manures before use. Cow manure is often salty, and may need to be mixed with gypsum. Because pet manure may contain harmful microorganisms, its use is ill-advised.

Non-freebies

As we all know, the organic matter just never seems to go far enough, so there's often a need to buy soil amendments from the hardware store or nursery.

Bagged topsoil gets a lukewarm response from Donna Matthews, AHS horticulturist, because it's hard to know its contents. At best, it won't contain as much organic matter as the raw material you can gather yourself; at worst, it could contain some pathogens. "I wouldn't use it by itself without adding organic matter," she said.

She was even less enthusiastic about peat moss, especially where soil tends to get boggy. Others agreed that it often gets more credit than it is due. It is actually hydrophobic: water will bead up on it and run off. When milled too finely, it can be almost mucky when wet and will cake when dry, observed Rieke, who advised home gardeners to use only sphagnum peat. Other soil scientists say that while peat varies in quality, it remains a valuable amendment when there are no concerns about the fact that it tends to raise the soil's acidity.

A relatively new amendment that is exciting gardeners who've tried it is composted sewage sludge. While the word sludge conjurs up something mucky, the composted version consists of dry, odorless particles, although its color and constitution vary somewhat from city to city.

Many gardeners and farmers are still afraid to use it because in the past, municipal sludge contained heavy metals and harmful organisms that prohibited its use on food crops. But a composting process

developed by the Agricultural Research Service (ARS) eliminates most of the industrial waste. Rufus Chaney of ARS said the composted sludge is ideal for distressed soils, such as those in new subdivisions, and unlike other amendments, provides a high level of nitrogen and phosphorus, and such trace elements as iron, copper, calcium, and magnesium. It also helps to lighten the soil and increase its water-holding capacity.

Chaney said some 200 communities have adopted the process; composting and selling the sludge is more cost effective than burning or hauling it. (Gardeners in communities where sludge is given away should be skeptical enough to check with local health officials about whether the sludge is being composted.)

Heat-dried sludge from Milwaukee is widely available as Milorganite. Chaney said that in the past, Milorganite contained high levels of heavy metals, but the process for refining it has reached the point that it can be considered safe for all uses. (The bag still advises against using it for food plants if you depend on what you grow for much of your diet.) The major difference between Milorganite and composted sludge is that the former releases about 80 percent of its nitrogen the first year, compared to 20 percent in composted sludges. It is used in small amounts, similar to a fertilizer, most popularly when seeding grass.

Hold That Tiller

It doesn't matter what you add to your soil if you beat it to death. A common gardening mistake is working the soil too much or at the wrong time. If you've invested in a rototiller, it's a shame to leave it sitting in the shed, and this is the best time to rev it up to create a new bed, said Rieke. But don't get carried away using a tiller on a bed that has already been created, he warned. Rototilling can destroy the natural structure of the soil, allowing clay particles to pack as they would in pottery, and will discourage helpful organisms from going about their normal business of competing with pathogens and breaking down organic matter. The heaving of soil that occurs in most zones during the winter will act naturally to cultivate the soil, he noted. Nor should gardeners work the soil when it's wet, try to make it perfectly smooth, or "beat it up till it's like powder," he added.

But don't fail to stir it at all. Layers of many amendments—unchopped leaves, grass clippings, straw—can form a solid mat that can slow water percolation and stop roots' vertical growth. Remember next spring to do your garden a good turn and take a fork to all the amendments you added this fall.

Enlisting Soil Soldiers

Agricultural Research Service/USDA

ARS soil scientist Jack Lewis with flats of zinnia seedlings that were exposed to the harmful mold *Pythium*. The healthier plants in the righthand tray were protected by treatment with the beneficial mold *Gliocladium*.

Soil scientists are building an arsenal of beneficial organisms to wage war against other organisms that are harmful to plants and to gobble up chemicals that make our environment less healthy for both flora and fauna.

In many instances, they are simply giving Mother Nature a boost by introducing a pathogen's natural enemy. In other cases they are manipulating a beneficial microorganism's genetic structure to make it tolerant of chemical controls. (Studies have found that sometimes the most efficient approach to disease control is a combination of bio-control, chemical control, and cultivars bred to be resistant.)

Some examples:

► Studies are underway on two beneficial fungi, *Gliocladium* and *Trichoderma*. When encased in pellets along with a food source and added to the soil, they have reduced by 75 to 95 percent the fungal pathogen *Rhizoctonia solani*. This fungus attacks some 200 plant species, including many vegetables and ornamentals.

► Also in pellet form is another mold, *Talaromyces flavus*, which has reduced wilt disease on potatoes by 14 percent and *Verticillium* wilt disease in eggplants by 75 percent. *T. flavus* is normally sensitive to chemical fungicides, but a transfer of genes between two strains of the fungus is expected to make it more resistant.

► Ultraviolet treatments have changed a strain of another fungus, *Trichoderma,* so that it can tolerate the fungicide benomyl. The strain, called T-1-R9, is used in the soil to increase disease resistance in chrysanthemums, carnations, and potatoes, but its unimproved form was often killed when benomyl was used to control diseases on plant leaves and dripped onto the soil.

► Fungi, bacteria, and other primitive microbes are being harnessed to clean up the toxins that are degrading the quality of our soil and water. "Bioremediation" is being used to clean up oil spills, toxic herbicides and pesticides, dry-cleaning solvent, and other pollutants.

Double Your . . . Fun?

Well, perhaps your garden's productivity. Double-digging is a lot like drinking prune juice: we suspect it might be good for us, but how many of us do it?

Donna Matthews, River Farm's horticulturist, swears by the process, which she calls French intensive gardening. "It *is* a lot of hard work. But it's a few hours of labor that will pay off for years. It gives you healthier plants and lets you plant them closer together," which has the added benefit of crowding out weeds and allowing plants to shade each other. Such an approach is a cornerstone of what is now being called bio-intensive gardening. By whatever name, the process is similar: Remove about a foot of top soil—about the width and depth of your garden fork—and set it aside on a tarp. Then loosen soil to the depth of another foot. Matthews takes the opportunity to further improve this soil by adding organic matter, usually leaves. Replace the top foot of soil from this first strip with the top soil from an adjacent strip, and so on down the row. Replace top soil from the last strip with the soil that you removed from the first strip and placed on the tarp.

Matthews said she hopes to employ double-digging on several River Farm perennial beds this fall, where plants are either being replaced or divided.

Compost ABCs

Beds that you can't or don't want to completely revitalize this fall can benefit from compost made in a separate pile or bin. One garden writer recently quipped that there may be only nine gardeners in America that don't make compost. True, most of us try, but some of us have better luck than others.

There are many successful approaches. You can tumble it in a plastic bin, cook it in a trash bag, or just heap it in a corner. You can devote lots of energy to a "hot" pile that will be ready in weeks, or take a more easy-going approach with a "cool" compost that gives worms and other organisms many months to do their duty. Those who have found the process discouraging might benefit from a few basics outlined by Tom Richard and Gretchen Ferenz of Cornell University in an article for *Grounds Maintenance*:

Microorganisms need both nitrogen and carbon. Woody matter and leaves are high in carbon, which will be more readily available if they are in finer form, such as sawdust or chopped leaves. However, an excess of carbon will slow the composting process. Grass clippings and manure are high in nitrogen, which speeds composting. But too much nitrogen will form ammonia and offend the neighbors. The answer is a blend of both, although the exact ratio is a matter of debate.

The microorganisms that serve as the laborers in the composting process also need both moisture and air. The compost should contain about as much water as a damp sponge: too little and these critters go on strike; too much and the aerobic good guys will make way for the anaerobic villians that produce smelly hydrogen sulfide.

Oxygen won't get very far inside the compost before being used up by the decomposition process; therefore, dense piles of grass clippings or matted leaves need to be turned frequently and mixed with other contents. Turning will also help manage compost temperature, which experts agree is the key to quick compost success. (Besides being fast, an advantage to hot compost is that it will sterilize weed seeds that might otherwise germinate in your beds.) The ideal temperature is about 140° F. If temperatures rise much above 160°, beneficial organisms begin to disappear.

Experts say there is no need to buy compost starter: garden matter is rife with all the microorganisms you need to get the process well underway. A good balance of carbon and nitrogen and frequent turning will speed the process as much as any magic ingredient. Some horticulturists say a friable, homogenous mixture may be ready in as little as three months. Ferenz recommends letting a compost cook for about a year, because the decomposition process forms organic acids that can be toxic to plants, especially seedlings. One soil scientist said you should give compost at least a year to break down any harmful pesticides that may remain on clippings or weeds. Since most of us don't wait that long, most experts say you should simply avoid using such materials.

Courtesy Soil Science Society of America

Basidiomycete fungus filaments decomposing forest leaf litter.

Green Manure

Green manuring isn't practical for perennial or shrub beds, but it's worth trying in a vegetable garden or in a newly created bed, especially around a new home where the ground has been severely disturbed by construction equipment.

Green manuring is the process of planting a bed with a crop for the express purpose of plowing it under to enrich the soil. Some crops used as green manures, such as kale, mustard, and fava beans, also are food crops.

Green manures can either be legumes, which add nitrogen to the soil, or nonlegumes, which don't add nutrients but help conserve nutrients already in the soil, add organic matter, and prevent erosion.

Timing is crucial in using green manures. Green manure crops need to be turned into the soil while still green, and in the case of leguminous plants, just as they begin to flower. Once the plant begins to set seed, it will draw on the nitrogen stored in its roots, stems, and leaves, and little will be available for your soil. Nonlegumes should be turned under before they flower.

Harvested green manure will decompose faster if you mix it with compost. Leave this mixture to break down for at least three weeks; the same organisms that are digesting the manure will also attack germinating seeds. And don't leave soil bare for more than three weeks, or nutrients such as nitrogen and sulfur can be leached away by winter rains. Depending on where you live and what you plant, it may be possible to plant a winter cover crop after you till under a fall crop.

Here is a list of green manures that can be planted in fall. All of them except kale will help fix nitrogen in your soil. Because their usefulness and time to maturity varies from climate to climate, we suggest calling a local extension agent for advice about what works best in your area. When you call, be sure to explain that you intend to use it for a home garden.

Plant	Conditions	Tips, benefits
Alfalfa	Likes well-drained soil; pH 6.5-7.5.	Deep-rooted perennial; cut several times; restores soil
Clover, alsike	Tolerates wet, heavy, acid soil; cold tolerant not heat tolerant	
Clover, crimson	Widely adaptable; cold and shade tolerant	Harvest in spring; fast grower; beautiful red flowers
Clover, red	Prefers loam dislikes poorly drained soil; suffers in very cold weather	Very fast growing; multiple cuttings
Clover, white	Prefers heavy loam; tolerates both shade and hot sun	Good weed competitor; takes regular mowing
Fava	Widely adaptable; frost resistant to 10°F	Upright bean; good for eating
Kale	Tolerates poor soil; hardy	Fast grower; edible leaves can be picked in winter; nonlegume
Rye	Widely adaptable; very hardy	Massive root growth; harvest very early in spring
Vetch, purple	Tolerates wide range of soils; cold to 20°F	Beautiful purple flowers; vigorous growth; smothers winter weeds
Vetch, winter hairy	Best vetch for sandy soil but tolerant of wide range; tolerates cold to 0°F	Plant all vetches early autumn north, early winter in mild winter areas; slow grower
Vetch, woolly	Tolerates poor soil, heat, drought; cold to 0°F	Medium fast grower

Most of the above information came from the 1989 catalog of Ecology Action, 5798 Ridgewood Road, Willits, CA 95490.

Caution Urged When Buying Bulbs

TRAFFIC, the trade-monitoring arm of the World Wildlife Fund (WWF), asks gardeners to make sure that any species bulbs they buy this fall have been propagated, rather than collected from the wild.

A study WWF has conducted over the past two years in conjunction with the Natural Resources Defense Council shows that many bulb species are being endangered by collecting that is being done in both the United States and in foreign countries.

The Netherlands is the major producer and supplier of bulbs, but that country is likely to obtain collected bulbs from other countries, says WWF. Turkey is the major source of such bulbs as *Galanthus* (snow drops), *Eranthus* (winter aconites), *Leucojum*, and *Sternbergia*. Portugal is the major source of *Narcissus* bulbs.

John A. Lynch

Trillium grandiflorum

Industry Response

The Netherlands FlowerBulb Information Center responded to the study results by saying that imports from Turkey represent less than one percent of Holland's annual production. Last year, of the 60 million flower bulbs that Holland imported from Turkey, 40 million were cultivated professionally on bulb farms and 20 million were taken from the wild.

Nevertheless, the Dutch growers and exporters group agreed with WWF that the practice of collecting bulbs from the wild should be examined for its potential long-term impact. A release from their New York-based information center said that the Netherlands Ministry of Agriculture and Fisheries was arranging a meeting with Turkish authorities to discuss steps to ensure that endangered species are protected.

"Not only is the flower bulb industry interested in preserving wild species for their own sake, it is in its longterm interest to do so because these original bulb flower types can be hybridized with existing varieties to produce new flowers," said Roland Boot, vice president of the North American Flowerbulb Wholesalers Association, an association of 36 import firms with close ties to the Dutch flower bulb industry.

The majority of bulbs commercially collected in the United States for export are *Trillium*, of which 13,000 were exported from April 1986 to April 1987. Thousands of *Calochortus* (mariposa lily) also leave the country, says WWF.

Trade Controls Needed

The foundation is asking horticultural groups to lobby for more accurate labeling of bulbs, and to support them in their call for monitoring of international bulb trade and support of research on commercial production of species bulbs.

More than 20 European countries, as well as China, Israel, South Africa, the USSR, and the United States, have passed laws to protect bulb species, but only *Cyclamen* and terrestrial orchids such as the lady's slipper are regulated internationally by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

In the past, the foundation has undertaken efforts to protect cacti, cycads, and to some extent, palms, said Jane MacKnight of WWF's plant program. They would like to do more to protect all North American wildflowers. Horticulturists are becoming increasingly concerned that carnivorous plants, such as the pitcher plant, are being endangered by collecting. Although the WWF staff is too small to make site visits to growers, that would be the ideal solution, said MacKnight, because it would protect both the plants and the dealers who are propagating bulbs.

"It's not in our interest to shut down legitimate growers," whose work serves to protect wild species, she said.

Some Safeguards

Buyers can never be 100 percent certain that the bulbs they buy have been propagated, but there are many indications that they have not.

Some bulbs are labeled "wild," "species," or "botanical," which should serve as a red flag that bulbs have been collected. (An exception is tulips, where "botanical"

Bulbs to Avoid

The World Wildlife Fund and the National Resources Defense Council urge gardeners to avoid these bulb species:

Amaryllis Family

***Galanthus* (snowdrops). *G. elwesii* can always be assumed of wild origin. *G. nivalis* is widely propagated and safe to buy.**

***Leucojum* (summer snowflake), especially *L. vernum* and *L. aestivum*.**

***Narcissus*, especially *N. triandrus* var. *albus*, *N. asturiensis*, and *N. cylamineus*. Be cautious about all small species.**

***Sternbergia* species.**

Lily Family

***Chionodoxa*, especially *C. sardensis*, *C. tmoli*, and *C. luciliae*.**

***Erythronium*, except for 'Pagoda', which is a propagated hybrid.**

***Fritillaria*. Use caution when buying *F. persica* 'Adiyamen' and *F. imperialis*. Avoid others.**

***Lilium*. Exercise caution with *L. martagon*.**

***Scilla* species. Be cautious; many are still collected in Turkey.**

***Trillium*, especially *T. grandiflorum*.**

***Tulipa*. Many tulips that have been called "botanical" are really small cultivars and safe to buy. Avoid *T. praecox*.**

Orchid Family

***Bletilla striata*.**

***Pleione* species.**

***Cypripedium*, especially *C. acaule*.**

Primrose Family

***Cyclamen*. Buy only from those few U.S. dealers that propagate their stock.**

Buttercup Family

***Anemone*. Blue or mixed stock of *A. blanda* may be from the wild.**

***Eranthis*, especially the popular yellow-flowered *E. hyemalis* and *E. cilicica*.**

usually indicates a cultivar of a species.) A new twist, said Dr. Richard Lighty, director of the Mount Cuba Center for the Study of Piedmont Flora in Greenville, Delaware, is to label a plant "nursery grown." This may indicate only that the nursery has potted a collected plant and grown it on the premises for a year, he warned.

He and MacKnight urged buyers to ask more probing questions: If you didn't propagate it, who did? If you did propagate this species, how did you do it?

These are the sorts of questions posed by the New England Wildflower Society every three years when it updates its list of nurseries that propagate their own wildflowers. The society propagates and sells some 10,000 wildflower plants a year, said William Brumback, the society's propagator. The New England group, like the newer Mount Cuba, is conducting research to find better means of propagating these plants, while at the same time, educating the public to keep wild populations from being decimated.

Propagation Costly

Lighty said that while there has been some success in propagating the double pink trillium, the single white *Trillium grandiflorum* takes at least five years to grow. If grown from seed, it takes a year to germinate and as long as 10 to bloom. "We have to get to the point where we can compete in price with the people with the gunny sacks," Lighty said. Price is therefore another clue that a plant has been collected. "I would question whether anyone could sell a trillium or terrestrial orchid for less than five dollars," he said.

MacKnight said it is sometimes possible to spot collected bulbs, which tend to be smaller and more misshapen than those that have been commercially propagated. The same is true of the plants themselves, said Lighty. Collected plants tend to have more defects than those that have been propagated.

The American Horticultural Society offers a free list of nurseries that sell propagated wildflowers. Include a self-addressed, stamped envelope with your request. An extensive list of sources for specific plants that have been propagated, as well as some general information on the topic, can be obtained for $6.95, postage paid, by writing to Nursery Source List, New England Wildflower Society, Inc., Garden in the Woods, Hemenway Road, Framingham, MA 01701. For the complete report, "Trade in Bulbs," call the World Wildlife Fund at (202) 293-4800, or write to them at 1250 24th St. N.W., Washington, DC 20037.

The Discrete Charm of Botanical Tulips

The common conception of tulips is of the long-stemmed beauties with cup-shaped flowers that, unfortunately, tend to be somewhat short-lived. But the increasingly popular species cultivars known as botanicals can be a charming addition to the landscape. Bred to retain the characteristics of their wild parents, most are smaller than the common cultivars and have more lily-shaped blooms. They come in a fairly narrow color range—red, yellow, white, and intermediate tints of those colors—but most are long-lived and will multiply like daffodils when left in the ground. They are ideal for the rock garden or naturalizing.

Courtesy Netherlands FlowerBulb Information Center

Clockwise from upper left, *T. urumiensis*, *T. turkestanica*, and *T. plaisir*.

Although the word "botanical" can be a red flag that a plant was collected in the wild, this is not the case with botanical tulips, said Frans van Nimwegen, executive director of Internationaal Bloembollen Centrum of Hillegom, Holland, which represents the Dutch flower bulb industry.

"A species or botanical bulb is one that retains the *characteristics* of its native forbears," he explained. "For instance many species tulips that were once native to Turkey have been propagated and cultivated in Holland for centuries, yet still retain the characteristics they had in the wild."

One hundred percent of the species tulips sold by the Dutch are grown and propagated within the borders of Holland, van Nimwegen added. Therefore, consumers can rest assured that named hybrids of the following species have been propagated rather than collected from the wild:

Tulipa tarda has abundant, narrow, deep green foliage, and blooms early. Each stem has five to six golden yellow flowers that open to a star shape with a white tip. Four to five inches tall, it is a good ground cover.

T. turkestanica is an early flowering bulb eight to 10 inches tall, similar to *tarda* but with more pointed petals. Each stem has seven to nine flowers, which open white and cream with a black and red heart, and narrow blue-green leaves. It multiplies rapidly into compact groups.

T. urumiensis, one of the shortest dwarf tulips at two to three inches tall, has bright yellow flowers that open in the sun late in the season. It is less vigorous than other botanicals and may wear out easily.

T. kaufmanniana includes many cultivars of the so-called water lily tulip. Foliage may be solid blue-green or bear a chocolate stripe. Stems of the four- to eight-inch plants are short. Flowers open in sun early in the season to form an almost flat, hexagonal star. The inside of the flowers, except the plain red varieties, is generally brighter than the outside, which is often white. The open flowers present a contrasting yellow or black heart.

T. greigii cultivars have rigid stems and early-season, medium-sized flowers that open wide in the sun to reveal a deep colored, often black heart. Flowers are often spotted, and leaves are almost always purple-striped or marked. Bulbs prefer to be left in the ground to multiply naturally. This class includes 'Red Riding Hood', one of the most popular botanical tulips.

Regional Notes

► Far from being the end of the gardening season, fall marks the beginning of some of the most desirable flowers and foliage plants, said Ray Rogers, senior horticulturist with Somerset County Park Commission in New Jersey, who devotes half of his garden to fall bloomers.

Favorite fall-blooming perennials: *Aster* 'Monch', a *frikartii* like the popular 'Wonder of Staffa', but bluer and straighter; *Chrysanthemum nipponicum*, the fall-blooming shasta daisy, which if cut back severely each spring forms a two-foot shrub that blooms September to November with "gangs" of daisylike flowers; and *Sedum seboldii* or October daphne. The latter, which will thrive in poor soil or rock gardens, is mound-shaped with blue leaves edged in maroon that encircle the stem. The flowers are a clear pink.

Rogers plants fall-blooming crocus to come up through *Sedum acre* or creeping thymes. The ground covers protect the crocus stem, provide contrast, and keep dirt from being splashed on the blossom during a rain. Rogers recommends *Crocus aitchisonii*, or for gardeners who want a challenge, the saffron crocus (*Crocus sativus*), which usually won't bloom the first year.

Autumn is also the time when you can expect a whole new crop of some annuals that reseed themselves. These include alyssum and *Malcolmia maritima*, or Virginia stock, whose flowers are white, green, blue, purple, and "drop dead magenta," and *Nicotiana* 'Moonbeam', which Rogers described as "manageably weedy." He also recommends *Verbena bonariensis*, which in Georgia's Callaway Gardens becomes dense like a shrub, but in New Jersey forms a four-foot curtain through which other plants can still be glimpsed. "It's not showy, but useful," said Rogers.

► North Dakotans can expect their first freeze by mid-month, but they can hang on to summer just a bit longer by doing what the nurseries do: set up a sprinkler in the evening and give plants a good dousing. As the water forms ice during the night, it will give off heat that will protect the plant until the air warms again the next morning.

David Bird, staff horticulturist with the International Peace Garden in Dunseith, North Dakota, said that hanging baskets can often escape damage from the area's first frost, but that by the first of this month, the staff has brought in the 20-year-old dracaena that they call their North Dakota palm tree, and the tuberous begonias. The latter are dug with the soil ball and placed in flats, misted periodically, and treated with a fungicide. Although the garden doesn't overwinter its tender geraniums, many of its Canadian visitors do, by hanging them barerooted upside down in a cool place, then replanting them

From Parking to Parkland

. . . Parking, 1981 . . .

. . . Parkland, 1989 . . .

Courtesy Sheridan Square Triangle Association

A group of Greenwich Village residents this spring saw the fruition of a dream when a former asphalt traffic safety island was officially declared New York City parkland.

The Sheridan Square Triangle Association established the three-sided Sheridan Square Viewing Garden in 1982 and has maintained it ever since, but until May, the area was still designated as a street on city maps.

The city's transportation department funded the site-preparation work, and a local community board awarded the group a start-up grant that allowed them to erect a cast- and wrought-iron fence. The association has raised $75,000 on its own for a reserve fund that will help pay for future maintenance. The garden work is done by volunteers, who include writers, artists, accountants, engineers, and a cable TV executive.

The 54-by-110-by-130-foot triangle contains more than 600 plants and shrubs and several blossoming trees. The terraced area was designed by a Greenwich Village horticulturist, Pamela R. Berdan.

outdoors in March, Bird said.

Tulips planted in their garden are invariably eaten by deer, but this is the month when his staff will be planting Asiatic lilies and daffodils, which will perform faithfully if planted six inches deep and selected to be hardy for the area. Bird advised buying bulbs and plants only from northern gardens; the majority of theirs come from Manitoba or Minnesota. Plants from elsewhere, even when labeled for Zone 3 or 4, are more likely to fail.

► In Nevada, many gardening activities can begin to pick up again after the broiling summer heat. Such annuals as pansies, snapdragons, stocks, calendulas, and violas can be planted now and will last through the winter. Others that do well are petunias, vincas, marigolds, and verbenas; roses and California poppies are "spectacular," said Dennis Swartzell, grounds superintendent and arboretum director at the University of Nevada-Las Vegas Arboretum. There is still time to plant winter vegetables, such as broccoli and cabbage. Frequently asparagus will put out a second crop.

Swartzell noted that winter's nighttime temperatures have been as low as 16° F on a couple of occasions, so even though days with 100° temperatures may occur into November, it's best to bring an end this month to severe pruning or heavy fertilization of trees or shrubs, which might produce a flush of growth prior to potentially cold weather. The grasses that do best here—fescue or Bermuda overseeded with rye—still need to be mowed.

He believes that local water prices, now incredibly low, will begin to rise in the near future, and encourages area residents to try some of the drought-resistant plants from the Mediterranean, Africa, and Australia that are becoming more widely available at local nurseries. His favorite trees include the acacias, which stay relatively small and produce attractive yellow "puff ball" flowers; and the *Chilopsis linearis* or desert willow, a 20- to 25-foot multi-truck tree native to Southwest arroyos with beautiful orchid blossoms. He is also partial to the Texas ranger shrub, or *Leucophyllum frutescens*, which has small, "mousy" gray leaves and lavender blooms that appear in profusion in high-humidity—hence its other common name, the barometer bush.

► Many gardeners still don't know that fall is a great time to start pansies in near frost-free areas such as Virginia. Although they are annuals, their roots will become well established in the fall and produce blooms by February, said JoAnne Gordon, horticulturist for the Norfolk Botanical Gardens. Pansies can successfully overwinter farther north with some protection. For the same reason, now is the time to plant shrubs and trees.

Fall is the best time to test soil and adjust its pH if necessary. In the Norfolk area, soil is acidic, which gardeners can correct quickly by adding hydrated lime, or more gradually, but with more lasting effect, with dolomitic lime.

This is also the time to seed or overseed fescue, using five to six pounds per thousand square feet. Fertilize with a high-nitrogen fertilizer after the first mowing; three monthly fall feedings are recommended. Chrysanthemums, which will have had their last pinching, need some 5-10-5 fertilizer, as do roses, which should continue to get a weekly spray through October, but no more pruning.

And don't forget your house plants that you brought outside last spring. They should be reacclimated to the indoors by a transition into a moderate-temperature room by mid-October. Be sure to give them a bath with insecticidal soap so you don't bring pests inside with them.

Gardener's Q&A

Sharing problems and solutions is a vital element of gardening. This column lets readers share in the extensive horticultural research done by our Gardener's Information Service.

Q: I have several banana trees that are doing fine but it occurred to me that I should fertilize them sometime soon. What kind of fertilizer should I use, and how often should I apply it?

–E.S., Miami, Florida

A: Bananas are herbacious perennials that need a great amount of nourishment, warmth, and humidity. They are heavy feeders, requiring weekly applications of a standard 20-20-20 fertilizer. Make sure that the soil is well-drained but never let the bananas suffer from lack of water as this is essential to growth and flower formation.

Q: I want to keep the deer out of my garden by building a fence, but I don't know if I should use a specific design or how high I should build it. Do you have any suggestions?

–M.R., Mt. Kisco, New York

A: To get the most effective results you need to use electrical wires. The mild shock will not harm or burn people or animals. It would be best to build the fence next spring so that the deer will get the message early in the season. There are two popular systems.

The two-fence method employs an outer fence about five feet tall with one wire running through it midway up from the ground, and an inner fence of the same height with two wires, one about a foot off the ground and a second wire close to the top. Because of this staggered pattern, the deer touch the top wire of the second fence first, and that is usually enough to persuade them to back off. In the one-fence method, the top of a five-foot fence tilts outward at a 45° angle. About seven electrified wires are used. Approaching the fence, the deer walks under the wires, hits a lower wire, and then backs out.

Materials for the fence can usually be found at the local farm supply or hardware store. The electricity can be supplied by a solar collector (backed up by a battery), an electrical socket, or by a battery alone.

Q: We have a weekend garden with about 25 asparagus plants. Last weekend I found almost all of them defoliated by asparagus beetles. How can I fight this pest without resorting to chemicals?

–M.B., Washington, D.C.

A: At this stage in the game, I recommend Sabadilla dust. Sabadilla is made from the crushed seeds of a tropical, lilylike plant. It can be dusted directly on the insects, on the moist leaves, or sprayed on both plants and insects.

Next spring, as early as possible, cover your plants with a lightweight fabric row cover. There are many new types on the market now that allow light and rain to come through but protect the plants from insects. The fabrics are light enough to let plants grow and push upwards. It would be useless to put the row cover on now because you would only trap the beetles inside the cover where they can munch on asparagus leaves in peace, but a combination of fabric and Sabadilla next year should help curb the asparagus beetles.

The same combination can be effective for preventing damage from squash bugs, stink bugs, harlequin bugs, cucumber beetles, cabbage worms, and loopers, as long as the fabric is applied while the plants are still immature.

–Peggy Lytton
Assistant Editor

Hoop Hoop Hooray

At last, a device to protect plants during the winter that can be built by someone who doesn't know a ratchet from a power saw!

George S. Switzer of Prince Frederick, Maryland, saw this hoop house while visiting the Goodness Grows Nursery in Crawford, Georgia, and was so taken with it he got permission from co-owners Rick Berry and Marc Richardson to share it in *The Azalean*, the publication of the Azalea Society of America.

Courtesy George Switzer

The Goodness Grows hoop house

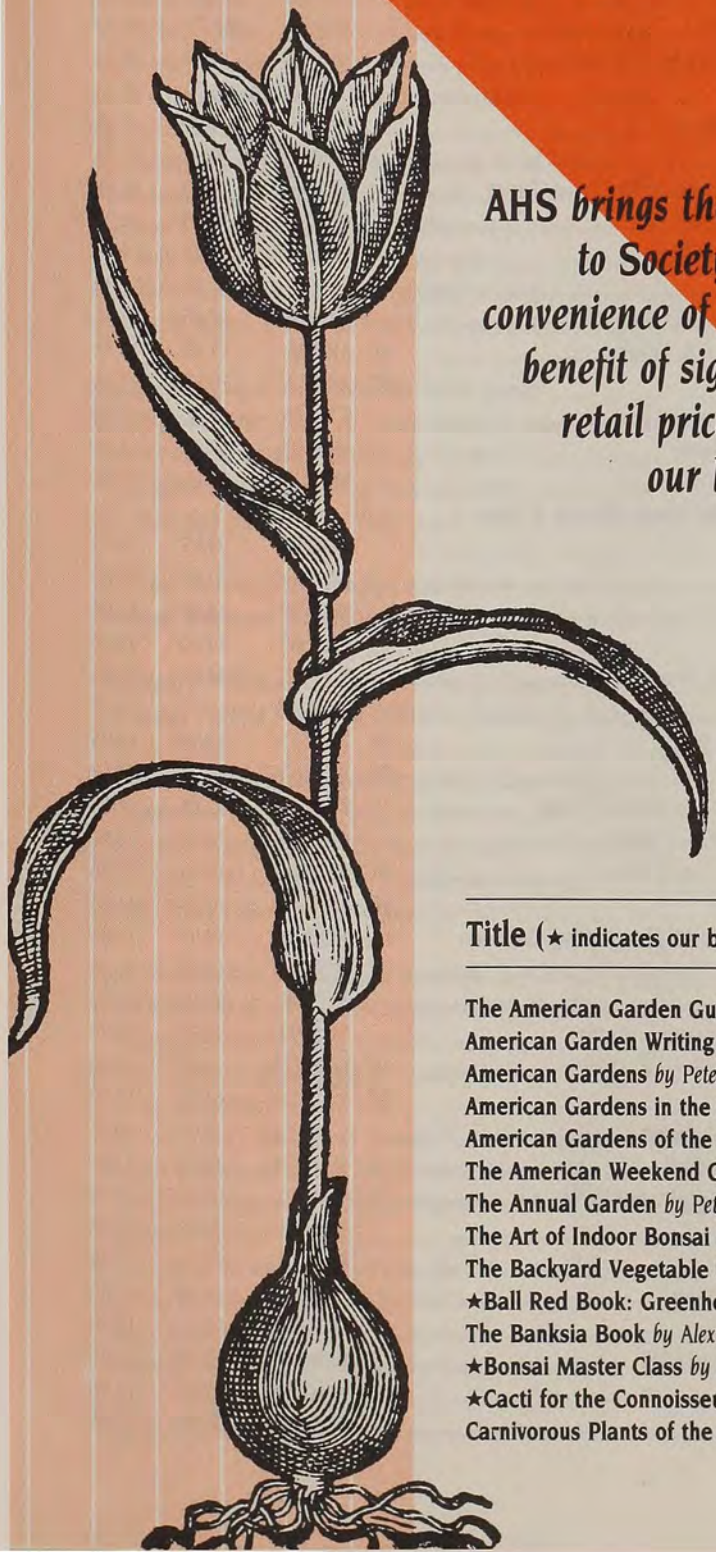
Switzer uses his to overwinter container stock, but the hoop house could also be used for cool weather vegetables or to protect cuttings if they are given slightly more protection by being planted deeper in the ground.

The hoop house shown in the photo is five feet wide, 18 feet long, and two and a half feet from the ground to the top of the ridge. The wood frame is made of two-by-six-inch treated lumber. Ridge and supports are two-by-fours, and the bows or hoops are three-fourths-inch plastic pipe. Switzer fastened the whole thing together by drilling holes in the pipe and nailing them to the wood. His cover is four-millimeter-thick white polyethylene.

Berry said his first hoop house, built of used lumber, cost only $35, but he now builds them of treated lumber for better wear. An expensive coldframe would have an automatic ventilation system, he noted; gardeners need to be aware of temperature and humidity changes so that they can give plants the appropriate ventilation manually.

American Horticultural Society

BOOK LIST



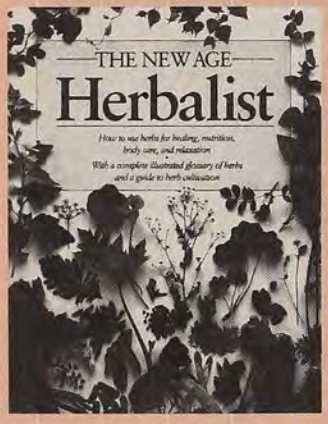
AHS *brings the best in gardening books to Society members with the convenience of mail-order and the added benefit of significant discounts from retail prices. Order today from our list of favorites!*

Title (★ indicates our best selling volumes)	Book Code	Retail Price	AHS Price
The American Garden Guidebook *by Everitt L. Miller & Jay S. Cohen*	EVA541	8.95	7.85
American Garden Writing *by Bonnie Marranca*	PAJ601	23.95	21.55
American Gardens *by Peter Loewer*	SIM627	35.00	28.00
American Gardens in the Eighteenth Century *by Ann Leighton*	VMA520	15.95	12.75
American Gardens of the Nineteenth Century *by Ann Leighton*	VMA554	15.95	12.75
The American Weekend Garden *by Patricia Thorpe*	RAN586	24.95	21.85
The Annual Garden *by Peter Loewer*	ROD605	19.95	15.95
The Art of Indoor Bonsai *by John Ainsworth*	DAV628	24.95	19.95
The Backyard Vegetable Factory *by Duane Newcomb*	ROD599	19.95	15.95
★**Ball Red Book: Greenhouse Growing** *by Vic Ball*	PRE297	37.00	32.75
The Banksia Book *by Alex S. George*	TIM448	24.95	21.25
★**Bonsai Master Class** *by Peter Chan*	STE606	19.95	15.95
★**Cacti for the Connoisseur** *by John Pilbeam*	TIM609	44.95	38.20
Carnivorous Plants of the World *by James & Patricia Pietropaolo*	TIM538	27.95	24.75

AHS BOOK LIST

As an ongoing service to our members and friends, AHS constantly evaluates hundreds of important garden and horticultural titles—far more than the popular books listed here.

Title (★ indicates our best selling volumes)		Book Code	Retail Price	AHS Price
Color in Your Garden *by Penelope Hobhouse*		LIT465	40.00	32.00
The Complete Book of Topiary *by Barbara Gallup & Deborah Reich*		WOR571	10.95	8.75
A Cook's Garden *by Jan Mahnken*		CPR462	12.95	10.35
Creating a Chinese Garden *by David H. Engel*		TIM539	38.95	34.12
Daylilies: The Wild Species & Garden Clones *by A. B. Stout*		SAG530	29.00	23.25
Designing with Flowers *by Tricia Guild*		CRO468	24.95	18.70
Dictionary of Plant Names *by Allen J. Coombes*		TIM449	9.95	8.48
Early American Gardens *by Ann Leighton*		VMA521	15.95	12.75
English Garden Design: History & Styles Since 1650 *by Tom Turner*		ANT508	49.50	40.85
The English Garden in Our Time *by Jane Brown*		ANT549	49.50	40.85
The English Woman's Garden *by Alvilde Lees-Milne*		MER225	24.95	19.95
Exotica 4 *by Alfred Byrd Graf*		ROE357	187.00	168.30
Farther Afield: A Gardener's Excursions *by Allen Lacy*		FAR466	17.45	13.55
Fine Preserving *by Catherine Plagemann & M.F.K. Fisher*	HC	ARI528	17.95	13.45
	SC	ARI529	9.95	5.45
★Flower Drying with a Microwave *by Titia Joosten*		STE626	8.95	6.90
Flowering Plants of the World *by V. H. Heywood*		PRE493	39.95	31.95
The Flowers Around Us *by Mary Parker Buckles*		VMI425	29.95	23.95
Flowers for All Seasons, A Guide to Colorful Trees, Shrubs & Vines *by Jeff & Marilyn Cox*		ROD577	24.95	19.95
Garden Accents *by Derek Fell*		HRW610	27.95	24.45
★Garden Blueprints *by Maggie Oster*		SIM630	14.95	11.95
The Garden Border Book *by Mary Keen*		CAP565	27.50	22.00
The Garden Design Book *by Anthony Paul & Yvonne Rees*		SAL585	34.95	27.95
★A Garden of Wildflowers *by Henry W. Art*		GAR458	12.95	10.45
★The Garden Primer *by Ray Maher & Carol Bolt*	HC	WOR624	24.95	19.95
	SC	WOR625	16.95	13.60
The Gardener's Handbook of Edible Plants *by Rosalind Creasy*		RAN516	12.95	11.35
Gardening by Mail: A Source Book *by Barbara J. Barton*		TUS505	16.00	14.00
Gardening with the New Small Plants *by Oliver E. Allen*	HC	HOU595	19.95	17.95
	SC	HOU596	12.95	11.65
Gardens by Design: Step-by-Step Plans for 12 Imaginative Gardens *by Peter Loewer*	HC	ROD502	19.95	15.95
	SC	ROD501	12.95	10.35
The Gardens of Ireland *by Patrick Bowe*		LIT518	39.95	35.95
Gardens of North America & Hawaii: A Traveler's Guide		TIM499	24.95	21.20
★Growing & Propagating Wild Flowers *by Harry R. Phillips*	HC	UNO410	24.95	21.20
	SC	UNO411	14.95	12.70
Growing & Saving Vegetable Seeds *by Marc Rogers*		GAR162	7.95	6.36
★Growing Good Roses *by Rayford Clayton Reddell*		HAR568	27.50	22.00
Growing Orchids (The Cattleyas & Other Epiphytes) *by Rentoul*		TIM100	19.95	16.95
Hardy Geraniums *by Peter F. Yeo*		TIM446	39.95	33.98
A Heritage of Roses *by Hazel Le Rougetel*		STE617	29.95	23.35
Historic Virginia Gardens *by Dorothy H. Williams*		UPC494	24.95	22.45
The History of Gardens *by Christopher Thacker*		UCA464	17.95	13.55
Home Landscaping *by Elizabeth Murray & Derek Fell*		SIM613	29.95	23.95
Hortus Third *by Bailey*		MAC356	135.00	112.50
★The Hosta Book *by Paul Aden*		TIM602	29.95	25.45



The New Age Herbalist

The shrinking of tropical rain forests has sparked fear that many medicinal plants growing south of the equator may become extinct. But our ancestors knew the practical value of many plants that still grow in our own backyards. This "new age" reference recounts those uses, and others that science is just uncovering. This book is worth having just for the full color photos that depict each plant so vividly you can almost smell and taste them.

HC-MAC 622 $28.15
SC-MAC 623 $15.25

Write or call for a complete list. Or, if there's a title that's of special interest to you and hard to find, contact us and we'll try to locate it and make it available at our reduced Society rates.

Title (★ indicates our best selling volumes)		Book Code	Retail Price	AHS Price
How to Grow Vegetables Organically *by Jeff Cox*		ROD575	21.95	17.55
The Indoor Garden Book *by John Brookes*		CRO543	40.00	30.00
Indoor Plants *by George Briggs & Clyde Calvin*		JWI544	52.50	44.00
Insect Eating Plants & How to Grow Them *by Adrian Slack*		VWA614	19.95	17.95
In an Irish Garden *by Sybil Connolly & Helen Dillon*		CRO517	27.50	20.65
Knott's Handbook for Vegetable Growers *by Oscar Lorenz & Donald Maynard*		JWI592	24.95	20.95
Landscape Photography a Kodak Guide *by Jeff Wignall*		MCG593	12.95	10.35
★Landscaping: A Five-Year Plan *by Theodore James, Jr.*		MAC621	21.63	19.50
★Lilacs: The Genus Syringa *by Father John L. Fiala*		TIM620	59.95	50.95
The Mail Order Gardener *by Hal Morgan*		HAR576	12.95	10.35
Manual of Cultivated Conifers *by Gerd Krussmann*		TIM506	65.00	55.25
The Little Bulbs: A Tale of Two Gardens *by Elizabeth Lawrence*	HC	DUK492	25.00	22.50
	SC	DUK491	10.95	9.85
Miniature & Dwarf Geraniums *by Harold Bagust*		TIM616	32.95	28.00
The National Trust Book of Gardening *by Penelope Hobhouse*		LIT522	29.95	26.95
Natural Pest & Disease Control *by Jim Hay*		DAV574	13.95	11.15
★The Naturalist's Garden *by Ruth Shaw Ernst*		ROD590	19.95	15.95
The New Age Herbalist *by Philip Dowell*	HC	MAC622	31.25	28.15
	SC	MAC623	16.95	15.25
The New American Garden *by Carole Ottesen*		MAC603	24.95	22.50
The New American Vegetable Cookbook *by Cronin & Glenn Brennan*	HC	ARI459	24.95	19.60
	SC	ARI460	14.95	11.75
Newcomb's Wildflower Guide *by Lawrence Newcomb*		LIT454	18.45	16.65
100 Great Garden Plants *by William H. Frederick, Jr., Catherine Plagemann & M.F.K. Fisher*		TIM527	27.95	23.75
101 Home Landscaping Ideas for Every Shape & Size Lot! *by Joel Lerner*		PRI594	9.95	7.95
Of Plants and People *by Charles B. Heiser, Jr.*		UOK441	24.95	22.45
The Oxford Companion to Gardens *by Geoffrey & Susan Jellicoe*		OXF514	49.95	44.95
★The Perennial Gardener *by Frederick McGourty*		HOU638	24.95	19.95
★Peter Chan's Magical Landscape *by Peter Chan*	HC	GAR588	21.95	17.55
	SC	GAR589	10.95	8.75
Plant Propagation Principles & Practices *by Hartmand & Kester*		PRE322	43.00	38.00
★The Pleasure of Herbs: A Month-by-Month Guide to Growing, Using, Enjoying Herbs *by Phyllis Shaudys*		GAR509	13.95	11.15
Private Gardens of England *by Penelope Hobhouse*		CRO540	40.00	30.00
Pruning Simplified *by Lewis Hall*		GAR511	12.95	10.35
★The Reference Manual of Woody Plant Propagation: From Seed to Tissue Culture *by Michael Dirr & Charles Heuser, Jr.*		VAR569	29.95	26.95
The RHS Encyclopedia of House Plants, Including Greenhouse Plants *by Kenneth Beckett*		SAL548	34.95	28.00
The Scented Room *by Barbara Milo Ohrbach*		CRO524	17.95	13.45
The Smaller Rhododendrons *by Peter A. Cox*		TIM443	29.95	25.48
Social Gardens *by Charlotte M. Frieze*		STE619	40.00	32.00
Successful Perennial Gardening *by Lewis & Nancy Hill*	HC	GAR597	29.95	26.95
	SC	GAR598	16.95	13.55
★Taylor's Guide to Annuals		HOU496	14.95	13.45

★The Garden Primer

Here's a great gift for beginning gardener friends. The bulk and breadth of this paperback might daunt readers who aren't sure yet just how serious they are about gardening. But the home gardener who is determined to absorb all the basics will want this volume at hand for ideas, answers, and explanations. As a bonus, it's replete with humor and delivered in a conversational style that makes this Connecticut landscape designer seem like a neighbor.

HC-WOR624 $19.95
SC-WOR625 $13.60

AHS BOOK LIST

Title (★ indicates our best selling volumes)		Book Code	Retail Price	AHS Price
Taylor's Guide to Bulbs		HOU497	14.95	13.45
Taylor's Guide to Ground Covers, Vines & Grasses		HOU535	14.95	13.45
Taylor's Guide to Houseplants		HOU534	14.95	13.45
Taylor's Guide to Roses		HOU498	14.95	13.45
Taylor's Guide to Shrubs		HOU537	14.95	13.45
Taylor's Guide to Vegetables & Herbs		HOU536	14.95	13.45
Vertical Gardening *by Caroline Boisset*		WEI629	24.95	19.95
The Victory Garden Kids' Book *by Marjorie Waters*	HC	HOU572	21.95	19.75
	SC	HOU573	12.95	11.65
A Weavers Garden *by Rita Buchanan*		WEA552	16.95	14.95
Wildflower Folklore *by Laura Martin*		GLO433	18.95	17.10
The Wildflower Meadow Book *by Laura Martin*	HC	GLO456	18.95	17.10
	SC	GLO457	12.95	11.65
Wildflowers Across America *by Lady Bird Johnson & Carlton Lees*		ABB587	39.95	31.95

The Backyard Vegetable Factory.

Describes innovative techniques such as vertical and container gardening, dynamic plant grouping and water conservation to help people with limited time and space bring more than 60 different vegetables from seed to supper table. Includes extensive charts and step-by-step illustrations.

ROD599 $15.95

Book Order Form

Please send me the following books at the special AHS member prices.

Book Code	Quantity	Book Title	Price Each	Total Amount

Postage & Handling	
TOTAL	

Please add $2.50 *per book* for postage and handling. VA residents add 4½% sales tax.
Please allow four to six weeks for delivery. Prices subject to change without notice.

Enclosed is my check for $ _____

Charge to: ☐ **Visa** ☐ **MasterCard Expiration Date** ____ **Acct. #** _____

Signature _____

Ship to: _____

Street: _____

City: _____ **State:** _____ **Zip:** _____

MAIL TO: AHS Book Service, 7931 East Boulevard Drive, Alexandria, VA 22308
(703) 768-5700 or (800) 777-7931

(89BL)

Gardener's Dateline

► **Through October 31. Rhododendron Species Foundation Gardens Open.** Information: P.O. Box 3798, Federal Way, WA 98063-3798, (206) 838-4646 (Seattle), or (206) 927-6960 (Takoma).

► **Sept.9-Oct. 8. Exhibit on "The Art of Botany."** Museum of Botany and the Arts. Information: The Marie Selby Botanical Gardens, 811 South Palm Ave., Sarasota, FL 34236, (813) 366-5730.

► **Sept. 10-12. Children's Gardens Symposium.** Information: Children's Education Department, Brooklyn Botanic Garden, 1000 Washington Ave., Brooklyn, NY 11225, (718) 622-4433.

► **Sept. 16. Orchid Symposium and Open House.** Information: Los Angeles State and County Arboretum, 301 N. Baldwin Ave., Arcadia, CA 91006-2697, (818) 446-8251.

► **Sept. 29-30. Plantsman's Garden Symposium.** Information: Plantsman's, University of California Botanical Garden, Centennial Drive, Berkeley, CA 94720, (415) 642-3343.

► **Sept. 30. Give the Earth A Hand Day.** Exhibits and activities illustrating biodiversity. Information: Santa Barbara Botanic Garden, 1212 Mission Canyon Road, Santa Barbara, CA 93105, (805) 682-4726.

► **Oct. 3. Illustrated Lecture by Sir Geoffrey Jellicoe** on "The Landscape of Civilization Created at the Moody Historical Gardens." Information: Continuing Education, Longwood Gardens, P.O. Box 501, Kennett Square, PA 19348-0501, (215) 388-6741, ext. 516.

► **Oct. 5. Unusual House Plants Lecture.** Information: The Huntington, 1151 Oxford Road, San Marino, CA 91108, (818) 405-2141.

► **Oct. 5-7. Conference on "Gardening for Pleasure in the South."** Information: Landscape Conference Registrar, Old Salem, Inc., Box F, Salem Station, Winston-Salem, NC 27108, (919) 721-7300.

► **Oct. 6-8. Conference on "Influences of the Past: Design by Nature—Nature by Design."** Information: Winterthur Information and Ticket Office, Winterthur Museum and Gardens, Winterthur, DE 19735, (302) 888-4600, or (800) 448-3883.

► **Oct. 7-8. Annual Chrysanthemum Show** of the New Jersey State Chrysanthemum Society. Frelinghuysen Arboretum, 53 East Hanover Ave., Morristown, NJ. Information: John A. Bednarz, (201) 345-0343.

► **Oct. 7-8. Rose Show.** Information: Atlanta Botanical Garden, Piedmont Park at the Prado, P.O. Box 77246, Atlanta, GA 30357, (404) 876-5859.

► **Oct. 7-8. Annual Gourd Show.** Information: O.C. Stevens, Show Chairman, 4761 Twp. Road 116, Mt. Gilead, OH 43338, (419) 946-3302.

► **Oct. 15-19. Fourth Urban Forestry Conference.** St. Louis, Missouri. Information: Fourth Urban Forestry Conference, American Forestry Association, P.O. Box 2000, Washington, DC 20013-2000, (202) 667-3300.

► **Oct. 17. Illustrated Lecture by Pamela Schwerdt of Sissinghurst Castle.** Information: Continuing Education, Longwood Gardens, P.O. Box 501, Kennett Square, PA 19348-0501, (215) 388-6741, ext. 516.

► **Oct. 19-22. Tropica '89.** Dade County Youth Fair and Expo Fairgrounds, Tamiami Park, Coral Way and S.W. 112th Ave., Miami. Information: South Florida Horticultural Society, Inc., 10000 S.W. 64th St., Miami, FL 33173, (305) 271-7483.

► **Oct. 20-21. Fall Plant Sale.** Information: Atlanta Botanical Garden, Piedmont Park at the Prado, P.O. Box 77246, Atlanta, GA 30357, (404) 876-5859.

► **Oct. 22-27. Autumn Color in Northern Arizona Tour.** Information: Santa Barbara Botanic Garden, 12121 Mission Canyon Road, Santa Barbara, CA 93105, (805) 682-4726.

► **Oct. 27-29. Mid-South Native Plant Conference on** "Using Native Plants in the Landscape." Memphis State University, University Center. Information: Mid-South Native Plant Conference, Lichterman Nature Center, 5992 Quince Road, Memphis, TN 38119.

► **Oct. 24. Perennials for the Landscape and Garden Center Industries Symposium.** Scott Arboretum of Swarthmore College. Information: The Pennsylvania Horticultural Society, 325 Walnut Street, Philadelphia, PA 19106, (215) 625-8299.

► **Oct. 27-28. Xeriscape Conference.** Albuquerque Garden Center. Information: Lynn Doxon, Cooperative Extension Office, 9301 Indian School Road N.E., Albuquerque, NM 87112.

Fabulous Fall

Autumn is the time for two of River Farm's most popular annual events. Sept. 9 is Dahlia Day, when these effusive flowers will be at their peak and members of the National Capital Dahlia Society will be on hand to answer questions. On Oct. 8, the society has its Fall Festival, when unusual plants and related crafts will be for sale. Visitors are welcome to picnic on the grounds during these events, both scheduled from 11 a.m. to 4 p.m.

AHS CALENDAR

Extra Large 10¾″x14″ Format!

☐ Member single copy price, $8.50 (Non-member $9.95) ..... $_____
☐ Member quantity price (3 or more mailed to *same address*), $7.75 each ..... $_____

Please add postage & handling charge ..... $ 1.50

VA residents add 4.5% sales tax ..... $_____

TOTAL: $_____

Please enclose check or charge to:
☐ Visa ☐ MasterCard Exp. Date _____

Acct. # _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

MAIL ORDERS TO: AHS/Calendar, 7931 East Boulevard Dr, Alexandria, VA 22308. Allow four weeks for delivery. Make checks payable to American Horticultural Society/Calendar.

Diamond Anniversary for BBG Children's Garden

Louis Buhle

High school girls in the garden in 1923.

Laurie Oswald

Newly planted plots being watered in 1989.

The 75th anniversary of the Brooklyn Botanic Garden's Children's Garden—the first children's garden in the nation—culminates this month with a symposium at which psychologists, landscape architects, educators, and others meet to share their research and observations on the importance of children interacting with plants.

A featured speaker will be Dr. Roger Hart, director of the Children's Environments Research Group at the Graduate School of the City University of New York. Hart's work has focused on the importance to children's development of allowing them to create landscapes. Hart has observed that not only urban highrises, but also suburban developments with their expanses of lawn and sterile vistas, deny children the materials with which to create roads, forts, and hideaways.

Mini-ecosystems

Children learn elementary earth science, and possibly moral lessons about protecting the environment, from observing and experimenting with these mini-landscapes, he has written, and gardens—as well as ponds and dirt piles—are "mini-ecosystems that serve as laboratories for children's dabblings, observations and questions." It's a commonly held belief that children learn empathy from having pets, but devoted gardeners, he notes, often speak of being attuned to the needs, if not the feelings, of their plants.

Other psychologists have held that active manipulation of the environment is needed for the development of a child's intelligence, or at the least, enabling the child to feel competent at bringing about change. But this occurs only when children actively participate, rather than having gardens created for them. "Real participatory planning projects have their own drawbacks," he acknowledges. "There is a danger of disillusionment or disappointment when children work hard and see nothing come of their work."

An environment such as a children's garden, staffed by professional horticulturists, can lessen the chance of such failures or convert them into less painful, and valuable, learning experiences. In the 1900s, when the idea for the garden was conceived by Ellen Eddy Shaw, it was customary for public schools to have gardens, but they tended to be scientifically, rather than practically, oriented.

One Graduate's Memories

In its 75 years, the BBG Children's Garden has had 15,000 graduates, many of whom have become professionals in related fields. A more typical graduate is Dr. Gerald Barad, whose vocation has been as a physician, but who has served on the American Horticultural Society's Board of Directors, and has recently been nominated as president of the Cactus and Succulent Society of America.

Barad said his mother's fondness for gardening may have directed him toward this interest in any case, but that the BBG experience was extremely influential. Ellen Eddy Shaw recommended him for acceptance to Cornell Agricultural School; he originally planned to become a plant pathologist. Barad said he was honored to be taught by such pioneers of children's gardening as Shaw and her successor, Frances Miner. A cousin who was also in the program, Gilbert Daniels, eventually served as president of AHS.

Long Commute

Barad commuted 35 miles to the BBG by subway from his home in Manhattan Beach, from the time he was eight years old until he was in high school. "Things were a little safer in the '30s," he said.

One lesson that has stuck with him was the discipline—what he called "nice habits"—that can be hard to learn later in life. "To this day I still plant beans two every four inches with the eyes down," he laughed. Children were taught to polish the handles of their hoes with an oiled rag and always return them to the same place. They planned their own garden layouts and kept strict records of what was harvested from each plot.

They also had indoor classrooms, as they do today. Barad recalls that he was only about 12 years old when he researched a paper on tulip breaking—the process of breeding multi-colored tulips by exposing them to viruses.

But perhaps most important was the "thrill of the harvest," he said. "For a city child to go home to his mother with a bag of fresh vegetables was quite an accomplishment."

Gardener's Bookshelf

The Complete Vegetable Gardener's Sourcebook

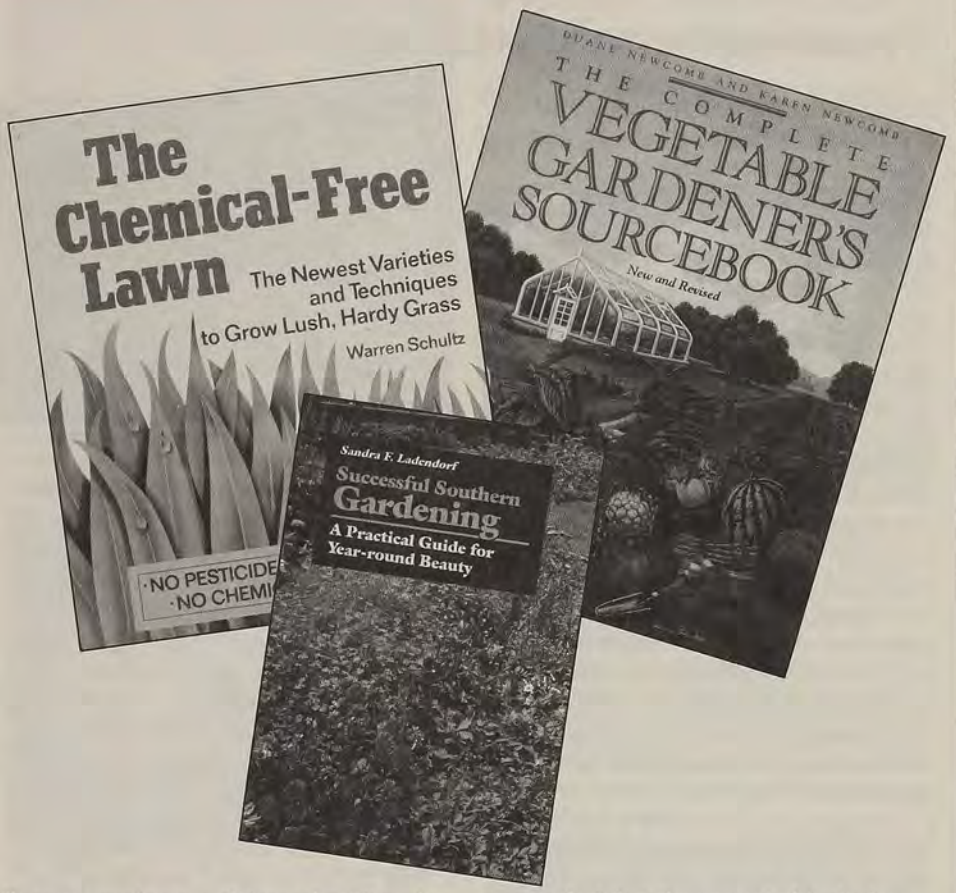
This book was first issued in 1980, but its authors note that since then, the vegetable cultivars available to home gardeners have more than doubled. Whatever the vegetable, it can now be grown bigger, smaller, faster, sweeter, or more colorful, if you so choose. And choose you can, from 260 pages of vegetables and herbs. Each is described by days to maturity, size, special characteristics, and sources. Before you get to the vegetables themselves, there are more than 100 pages of tips on gardening materials and tools: why you might need them, how to use them, their advantages and disadvantages. By Duane Newcomb and Karen Newcomb. Prentice Hall Press, New York, 1989. 408 pages. Black and white photos and illustrations. Publisher's price: softcover, $14.95. AHS member price: $8.95.

The Chemical-Free Lawn

The only argument we have with this book is its first sentence: "The good old, clean-cut American lawn is back in style." Only recently has there been an indication that the all-grass front yard could go *out* of style. But most homeowners will retain some turf, for its appearance, for a play surface, for the feel of it between their toes. What is decidedly out of style are chemicals to keep it lush; this book is intended to help you kick the lawn-drug habit. It will start you off right, with improved soil, and a choice of grass best for your area, needs, and tastes. Here's how to feed with seaweed and composted sludge; kinder and gentler mowing techniques; "water wisdom"; and ways to frustrate weeds, put the kibosh on bugs, and head off disease. By Warren Schultz. Rodale Press, Emmaus, Pennsylvania, 1989. 194 pages. Black and white drawings. Publisher's price: hardcover, $21.95; softcover, $17.55. AHS member price: hardcover, $14.95; softcover, $11.95.

Successful Southern Gardening

Those of us who have gardened in only one location quail at contemplating a major move. Imagine having not only to plant, but to *learn* all over again! But this veteran gardener had experienced Connecticut, California, and Michigan when her husband's work took them to Chapel Hill, North Carolina, and the opportunity to



"learn to garden to a different beat," as she puts it. This is not a guide or a reference book. The author has penned long, breezy chapters on seemingly everything growable in the South, and doused them liberally with personal prejudices and interviews with experts. As a result, information is not easy to find, but the amount of it she has packed in is absolutely staggering. By Sandra F. Ladendorf. University of North Carolina Press, Chapel Hill, 1989. Publisher's price: hardcover, $24.95; softcover, $21.20. AHS member price: hardcover, $12.95; softcover, $11.00.

Book Order Form

Please send me the following books at the specially discounted AHS member prices.

☐ **THE COMPLETE VEGETABLE GARDENER'S SOURCEBOOK $8.95**
SIMON 6540

☐ **THE CHEMICAL-FREE LAWN**
- ☐ **Hardcover..... $14.95**
- ☐ **Softcover..... $11.95**

RODAL 6520

☐ **SUCCESSFUL SOUTHERN GARDENING**
- ☐ **Hardcover..... $12.95**
- ☐ **Softcover..... $11.00**

UNORT 6530

I would like to order _____ books.

Please add $2.50 per book for postage and handling. Virginia residents, also add 4½% sales tax. Please allow six weeks for delivery. Prices are subject to change without notice.

☐ **Enclosed is my check for $_____**

☐ **Charge to:**
☐ Visa ☐ MasterCard Exp. Date: _____

Acct. #_____

Signature _____

Ship to _____

Street _____

City _____

State _____ Zip _____

Daytime phone number _____

MAIL TO: Sandy Abel, AHS, P.O. Box 0105, Mount Vernon, VA 22121.

AHS Bulletin Board

Preserving the 'Land' in Landscape

MINNEAPOLIS, Minn.—How much are we as individuals willing to give up for the greater good of our environment? Former Minnesota Governor Elmer Andersen challenged American Horticultural Society members with that dilemma at a design symposium prior to the society's annual meeting here in July.

The topic of the symposium was "Stewardship of Our Land—Design That Merits Attention." A half dozen speakers with widely divergent perspectives described design that restores, preserves, or highlights our natural environment.

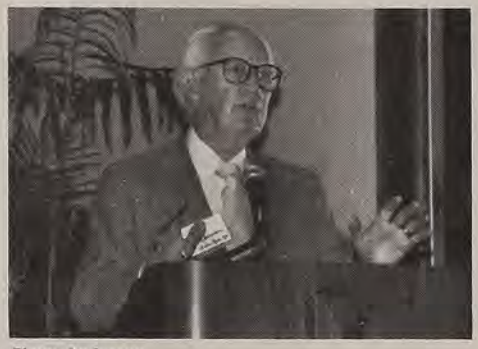
Andersen captured the spirit of the theme in his brief keynote talk. By describing his recent, first experience in composting, he transformed the process from the mundane to the miraculous. "It isn't very rational for an advanced civilization to dump its refuse without any organization," he observed.

But changing our ways won't be easy. Andersen pointed to a recent move by the legislature in Minnesota, where grasshoppers are obliterating this year's corn, to allow insecticides that are fatal to birds to be sprayed not only on farmlands, but also on neighboring property over the owners' objections. Andersen called the measure "violent legislation." But protecting our environment may force us to take similar steps that will violate what has been a cherished American freedom, he warned: we may no longer be able to do whatever we wish with our own land.

A big draw to the meeting was James van Sweden of the Washington firm of Oehme and van Sweden, whose work has recently taken the landscape world by storm. "When we had lunch with Ladybird Johnson recently she said she is beginning to love grasses," van Sweden said, although many people still tell him that their meadowlike designs "make them itch."

Oehme-van Sweden landscapes combine vast sweeps of color, strong vertical and kinetic elements—usually through grasses—and low-care plants that provide visual interest throughout the year. They are an antithesis to lawns and shrubs that "have been carved to look like marble," as van Sweden put it.

A strong counterpoint to their rich and romantic gardens is the approach of Arthur Edwin Bye Jr. of A.E. Bye and Associates of



Elmer Andersen

James van Sweden, Kate Christianson

Fred McGourty

Cos Cob, Connecticut. Bye has been called an architect's landscape architect because his spare look makes a structure's features more immediately apparent. Bye never uses what could be called a garden and admits that he knows little about non-woody plants. Instead, he likes to highlight natural features that many of us fail to appreciate. His slides highlighted shadows falling across a rolling lawn, gnarled and even dead tree limbs, the patterns made by melting snow, or the sun backlighting translucent leaves—a quality he calls luminosity.

Fred McGourty, on the other hand, is a plantperson's plantperson. An expert on unusual perennials and the winner of this year's AHS writing award, McGourty encounters harsh conditions and a number of gardening challenges on his Hillside Gardens in Connecticut. But he has shown that any spot—boggy, shady, rocky, or tree-root-invested—can be made beautiful without major upheaval if only one is sensitive to a plant's needs.

Another way to make the plant fit the place is to ask "What was your yard before it was your yard?" That was suggested by John Averett, director of research for the National Wildflower Research Center in Austin, Texas. The center is trying both to save wildflowers—10 to 15 percent of which are in danger of extinction—and to encourage their use in landscape design.

Averett showed that they can be used effectively along roadways and in parks, and as landscaping for commercial buildings. Native plants don't require fertilizer or pesticides; one business that switched from lawn to wildflowers estimated that maintenance costs dropped from $1,000 to $5 per acre per year. For the homeowner afraid of appearing too radical, he showed a lawn and foundation planting design: the lawn was buffalo grass (requiring only two to three mowings a year) and the foundation plantings were yucca and native shrubs.

Wildflowers also provide a haven for wildlife, and some people hesitate to plant them because they fear the wildlife will be too wild, said Averett. "The strangest argument we've heard is that they attract bees and bees make honey and honey attracts bears."

A natural landscape of a different kind is created by Edgar Garbisch, a restoration designer and contractor and marsh plant specialist in St. Michaels, Maryland. For 19 years, he has been reclaiming wetlands, which are important in preventing erosion, storing and cleansing storm water, and providing habitat for fish and wildlife.

The process involves moving tons of sand—one project called for hauling an entire island of sand into a bay on a barge six square yards at a time—and planting it with such bog-loving plants as salt marsh hay, button bush, sweet gum, lizard tongue, and hibiscus. Seed for the plants is harvested by hand and grown in a greenhouse, then planted in the new landscape in amounts of up to 10,000 plants a day. In one growing season, a muddy,

vertical, eroding bank can be transformed into a lush, gently sloping area that protects the shore behind it; a natural environment displaced by a highway can be recreated in a waste area a few miles away.

While Garbisch is busy reclaiming wetlands, John Peterson and his staff at AmeriFlora '92 are reclaiming an urban park in Columbus, Ohio. AmeriFlora, timed for the 500th anniversary of Columbus's voyage to the Americas, will feature a short-term display, from April 3 to 19, 1992; and a long-term exhibition, from April 20 to October 12 of that year.

The short-term festival will be the first floral and garden festival in the United States to be sanctioned by the International Association of Horticulture Producers. The organization sanctions events that revitalize areas blighted by wars or other causes; AmeriFlora '92 promoters promise that it will be on a par with the popular European festivals such as Floriade in Holland. The long-term display, said Peterson, will leave a heritage for the people of Columbus and the country. The century-old Franklin Park Conservatory will be expanded and remodeled; on the 160-acre festival site in Franklin and two other parks, trees will be replaced and a world-class garden left behind.

First AHS Annual Appeal Launched

The Board of Directors of the American Horticultural Society has launched the society's first annual appeal with a $300,000 challenge grant matching annual contributions on a dollar-for-dollar basis.

This year's funds will be used to support the Society's library, expand publications, broaden the seed and plant exchange program, provide year-round internships, increase AHS-sponsored educational programs and seminars, and help in restoring the gardens and grounds of our River Farm headquarters.

The annual fund is a first step in building a base of support for a capital campaign. In this context, two new gift societies have been formed to encourage greater annual support. The George Washington Society features special programs and recognition of donations at the $10,000-plus level, and the Liberty Hyde Bailey Society honors those contributing $5,000 or more. These join the already existing President's Council, designated for gifts of $1,000 or more.

In response to the first appeal mailed in June, $50,000 had been received by the end of July.

Paul Rogers of Charlton, Massachusetts, a longtime AHS member who has a radio call-in show and a twice-weekly newspaper column, always provided a ready answer for other members and staff when we were stumped about a plant's identity.

Ann Willis, Linville, North Carolina, and her daughter Mary Parker, who lives in nearby Banner Elk, both came to the meeting for the first time this year. Willis is an amateur gardener and Parker is a grower who recently branched out from Christmas trees to shiitake mushrooms and native rhododendrons and azaleas that she propagates from seed.

Dan Rice, an amateur gardener from Independence, Missouri, and Paul Schweitz, a landscaper for St. John's Abbey in Collegeville, Minnesota, take notes on ideas suggested by the Home Demonstration Garden at the University of Minnesota Arboretum.

Who attends the annual meeting? Amateurs and professionals, old friends and newcomers, who have found that some—or many—facets of horticulture bring a special joy to life.

Larry Harder of Ponca, Nebraska, enjoys the annual awards dinner with Sonia Lippincott of Anderson, Indiana, left, and Millie and Sid Clinkscales of Norfolk, Virginia, right. Harder nominated several friends for membership in AHS and as a result, won an all-expense-paid trip to the annual meeting. For Harder, a Farmer's Home Administration employee, it was the first AHS meeting ever but the fifth gardening meeting this year: he is or has been a member of some 30 gardening societies. In spite of his commitments to the iris, hosta, and daylily societies, Harder said he had such a great time that he would be back for the 1990 AHS meeting in Seattle.

Phillip Huey of Dallas and Hazel McCoy of Goldwaite, Texas, discovered that they had a lot of horticultural information to share. Many of the same plants grow in Texas and Minnesota, they found; they just bloom at very different times.

Lorna McManus

It seemed auspicious that the arboretum's delicate blue 'Betty Corning' clematis was in bloom when Corning visited with the AHS tour; she obliged by posing for a photo with her namesake, which she says she "rescued" near her home in New York.

How Much Is That Dogwood Through Our Window?

Little did we know when we ran the July story on landscape appraisals, accompanied by photos of storm-damaged trees, that before the issue was off the press our own beloved River Farm would look like a page torn from a consulting arborist's textbook.

The most dramatic damage from the June 14 rain and windstorm that ravaged much of the Washington, D.C., area was to a 40-year-old pine that was uprooted and toppled across the brick fence behind our perennial bed. The perennials under its branches, many of them new this season, were also lost. A large pine limb left a hole in our library roof. Several cedars were damaged so badly that they will have to be removed, said Donna Matthews, River Farm's horticulturist. Limbs were lost on a Kentucky coffee tree, a tulip poplar, a black locust, and several white pines, and the top was broken out of a hemlock.

None of the property's historic trees, such as the walnuts believed to have been planted by George Washington or our huge osage orange, were badly damaged. Matthews said it isn't surprising that younger trees sustained most of the damage. "Fast-growing trees have cells that are larger and more brittle, and more susceptible to damage," she noted.

"The problem with the older pine," she went on, "was that it was sitting on top of an underlayer of clay; it had no deep roots whatsoever." Matthews said the clay layer is about 18 inches deep. In planting replacement trees, she plans to drill a circle of holes around each tree that will allow roots to grow down beyond this compacted layer.

Homeowners Dismayed

As was the case with most of the homeowners in the Washington area, our insurance covered only damage that trees inflicted on structures, such as the library and fence, and the cost of removing those trees, but not replacement of the valuable trees themselves. Some policies cover damage to trees from fires, vandalism, or vehicles, but not "acts of God." Many homeowners were shocked to discover that insurance would not replace their valuable trees, and they were also stunned when some tree companies admitted upfront that they were charging double or more their usual rates for tree removal during this crisis.

The storm and the cleanup in its aftermath raised a number of questions: Why were some trees severely damaged in an almost bizarre manner—sheared in half vertically, one limb knocked out of the center of the crown, or completely uprooted—while trees of the same species only a few feet away were undamaged? Is there any way homeowners could recognize this danger in advance of a storm and prevent it? How could homeowners protect themselves from carpetbaggers who took advantage of the situation to charge three or four times the going rate for tree removal?

Kathleen Fisher

Unfortunately, some storms are of such magnitude that not much can be done to prepare for them, said Walter Money, president of Guardian Tree Experts in nearby Rockville, Maryland.

Preventive Steps

Money and Lew Bloch of American Tree and Landscape Company in Washington, D.C., noted that trees with an excess of suckers and foliage may be more susceptible to toppling because wind will hit them hard, much like the sail of a boat, rather than passing through their limbs. Their tops also become heavier when saturated with rain, as they were when the 70-mile-per-hour winds struck the capital this summer. Such trees can be made more storm-proof by judicious pruning—not radical topping, they said. Bloch said that a tall and skinny tree also poses a risk, and that pruning will encourage such trees to branch out.

These steps are not guarantees. Money said that in the heart of the windstorm, some clients lost trees that Guardian had just finished pruning. But on the periphery of the storm, preventive measures did make a difference. Money said he received a thank you from one client, for whom his crews had recently used cables and rods to secure a swaying, splitting maple. The maple survived the storm while many of its neighboring trees did not, the letter said.

Both arborists said many problems that make trees more susceptible to storm damage, such as root rot or shallow roots, are not outwardly visible. Periodic professional "check-ups" of your property can prevent major surgery later, and it's also reassuring to have a relationship with a tree "doctor" should an emergency operation become necessary. Bloch was still getting more than 100 calls a day a week after the storm; Money said his firm was turning down all requests for service from callers it had not worked for previously.

Fair Charges

Both said they were charging slightly more than the usual rates. Money said that 10 to 25 percent more was not unreasonable because crews were being paid overtime, and additional power equipment was needed for many jobs.

He believed that many news media accounts and rumors of people being charged several thousand dollars for the removal of one tree had become exaggerated, but he noted that costs could vary greatly, depending on the circumstances. In one case, where a tree had fallen on a house and across a swimming pool, crews had to remove the tree by building a series of scaffolds, and the bill came to nearly $5,000. In another case, they were able to remove three large trees and their debris for about $1,500. Some companies charge by the hour, and some by the job, Money said: you may want to get estimates from one of each.

"People are very emotional when they lose big old trees," he said. "I would advise them not to become emotional, and unless the tree has damaged the structure, to wait until the

Continued on back cover

Members Forum

In your May issue there was an interesting and enlightening article titled "Xeroing in on Water Waste." In spite of our overabundance of rain in recent weeks, the subject and your treatment of it is appropriate to today's world.

However, there is a statement I must challenge: "Because landscapes consume an estimated 40 to 70 percent of municipal water, they are a growing concern in all areas of dwindling water supplies."

First and foremost, I challenge the veracity of the statement. I do not have statistical information, but I cannot believe that in cities containing the bulk of the U.S. population, 40 to 75 percent of water use is for landscapes. In drought years in states east of the Mississippi and all states north of the 35th Parallel, the growing season is limited to five or six months. This leaves half the year when landscapes would need almost no water.

Even in cities such as Phoenix, Albuquerque, Salt Lake City and Sacramento, I cannot believe that more than 50 percent of the municipal water use goes into landscapes.

My second concern about your statement is the fear it will be used by special interest groups in competition for water "rights." Do you want a car wash or a garden? Do you want a beverage maker or a park? This could go on and on.

Yes, we do need to be concerned about the plants (and lawns) we use in our landscapes whether private gardens or public parks. But let us not overstate our case and use faulty statistics to make a point.

The American Horticultural Society is a loud and prestigious voice for the dissemination of horticultural information. It is imperative for all information to be accurate and useful.

R.J. Hutton
Chairman of the Board
The Conard-Pyle Co.

Ken Ball, former board member of the National Xeriscape Council and water conservation specialist for the Denver Water Department, said these figures surprise many people. But studies by water conservation districts show that nationally, annual residential outdoor water use averages around 40 percent. This varies around the country: Denver residents use 51 percent of their water outdoors, primarily for landscape purposes. In nearby Fort Collins, officials say that on hot, dry days, 80 percent of water consumed is used outdoors. In Northeastern areas with high humidity and precipitation, outdoor use might be as low as 20 to 30 percent annually, Ball said.

"The fact is, most people have no idea how much water they use for various purposes. We're encouraging them to analyze water use, be more aware of it, and to conserve."

Xeriscape proponents champion more water awareness when choosing landscape plants. On behalf of rose lovers and rose growers such as Conard-Pyle, Ball said, "You can have roses in a Xeriscape! Beautiful rose beds require less water than turf areas, unless those turf areas are of native, non-irrigated species."

In the matter of dogwood anthracnose, subject of an article in the July *News Edition*, Dr. Frank Santamour is quoted as saying "The fungus is spread by wind and water movement."

I would suggest that the autumn migration of birds, particularly robins, be considered as an additional factor in the spread of the fungus. We have a number of dogwood trees in a residential area that so far seem not to have been damaged by the fungus. However, each autumn the ripening dogwood berries are stripped from the trees in a matter of a couple of days by large numbers of very large robins.

I love birds and regret that perhaps they could be an instrument in the destruction of part of their food supply on their southern migration.

Elizabeth Aughey Vos
McLean, Virginia

We checked back with Frank Santamour of the National Arboretum to ask him about this possibility. He said it is unlikely that birds have a role in this epidemic among our native dogwoods. The anthracnose spores develop on the leaves, and birds light only on branches. But more importantly, the fungus is transmitted in early spring, while leaves are still fresh and green. By the time the berries are ripe and birds are migrating in the fall, there are no spores to be spread, he said.

The Best Bonsai

The National Bonsai Foundation, Inc., is seeking nominations for bonsai to be included in the North American Bonsai Collection at the U.S. National Arboretum in Washington, D.C. Bonsai must have been styled and trained by a resident of North America; imported bonsai will be considered only in exceptional cases and if they have been trained for more than 20 years by a North American resident. Nomination deadline is October 1. For more information, contact William N. Valavanis, 1070 Martin Road, West Henrietta, NY 14586, (716) 334-2595.

Send Those Seeds!

It's that time again. **November 1** is the deadline to send seed for the 1990 AHS Seed Program. We would like to see more members sending seed—and more of you ordering seed when our catalog comes out in January. Please follow these guidelines:

- ► Collect seed only from plants that you can correctly identify by scientific name. Include the cultivar name where applicable.
- ► Allow seed to mature sufficiently before harvesting.
- ► If seed cleaning is necessary, please do this before sending the seed to us.
- ► Allow the seed to dry sufficiently before packaging.
- ► For shipping, pack seed in an airtight and moisture-tight container. Mail the seed in a sturdy, crushproof container.
- ► Give any information you can regarding germination methods and conditions.
- ► Late arriving seed will have to be held for the 1991 program.
- ► It would be very helpful if you could also supply a plant description, cultural requirements, seed harvesting date, and germination percentage if some of the seed has been tested for viability.

Correction

Helping AHS Executive Director Frank Robinson plant a sycamore on National Arbor Day as a symbol of the Society's support for the American Forestry Association's Global ReLeaf Program was A. Alan Hill, chairman of the White House Council on Environmental Quality.

Travel/Study Trips for the AHS Gardener

January 14-21 and January 21-28, 1990
Gardens of the Caribbean Windward Islands

Explore tropical orchid collections, magnificent rain forests, historical sugar plantations, sparkling beaches, and beautiful Caribbean homes. Highlights are the oldest botanical garden in the Western Hemisphere in Kingstown, St. Vincent (1765) and Jean-Philippe Thoze's Balata Gardens in Martinique.*

March 28-April 8, 1990
Garden Paradise of Costa Rica

Stops include the National Museum of Costa Rica; CATIE, the largest tropical research center in Latin America; Guayabo National Monument, a major archeological site dating back to 800 A.D.; Monteverde Cloud Forest Reserve, where you can see a volcano and rare, exotic birds; and Corcovado National Park.*

April 21-May 6, 1990
Belgium and Holland

This repeat of an exciting 1985 tour will include the Floralies in Ghent, Belgium, and barge trips along canals in Holland. Conard-Pyle's Richard Hutton will guide the tour.

Passages Unlimited, 2 Oliver Street, Eighth Floor, Boston, MA 02109 (800) 232-2939

July 22-31, 1990
Natural Gardens of Alaska

Cruise aboard the MV *Sea Lion* and see nesting bald eagles, mountain goats, black bears, and humpback whales, as well as spruce forests, fields of lupines, and giant ferns. The boat will pass by Admiralty Island, enter the Tracy Arm, Glacier Bay, Elfin Cove, Le Conte Bay, and Rudyerd Bay, then disembark at Prince Rupert. There is a post-cruise excursion July 31 to August 2 to the Buschart Gardens on Victoria Island.*

November 3-10, 1990
Gardens of the Colonial South

Board the Yorktown Clipper luxury yacht in Florida and travel north to old Southern gardens on Sea Island; private gardens in Savannah; a seaside Japanese garden in Hilton Head; Orange Grove Plantation; the significant gardens of Charleston; Drayton Hall, a 1738 plantation; and Middleton Place, site of the oldest landscaped gardens in America.*

*Leonard Haertter Travel Company, 7922 Bonhomme Avenue, St. Louis, MO 63105 (800) 942-6666

Classifieds

Classified Ad Rates: $1 per word; minimum $20 per insertion. 10% discount for three consecutive ads using same copy, provided each insertion meets the $20 minimum after taking discount. Copy must be received on the first day of the month two months prior to publication date. Send orders to: American Horticultural Society Advertising Department, 80 South Early Street, Alexandria, Virginia 22304. Or call (703) 823-6966.

AFRICAN VIOLETS

America's Finest—177 best violets and gesneriads. Color Catalog and Growing "Tips" $.50. FISCHER GREENHOUSES, Box H, Linwood, NJ 08221.

THE AVANT GARDENER

DIFFERENT, EXCITING, GREAT FUN TO READ—for the gardener who wants to get more out of gardening! Subscribe to THE AVANT GARDENER, the most useful, most quoted of all gardening publications. Every month this unique news service brings you the newest and most practical on-going information—new plants, products, techniques, with sources, plus feature articles, special issues. 20th year. Awarded Garden Club of America and Massachusetts Horticultural Society Medals for outstanding contributions to horticulture. Curious? Sample copy $1. Serious? $10 full year (reg. $15). THE AVANT GARDENER, Box 489M, New York, NY 10028.

BONSAI

BONSAI TREES, pottery, books, tools, trays, supplies, and soils. Catalog $2.50. BONSAI CREATIONS, P.O. Box 7511AH, Ft. Lauderdale, FL 33338.

BONSAI PLANTS, INDOOR AND OUTDOOR, IMPORTED POTS AND TOOLS, BOOKS, SUPPLIES. CATALOG $1. BONSAI FARM, BOX 130W, LAVERNIA, TX 78121.

BONSAI, dwarfed conifers, pines, maples, tropicals, stock, and cuttings. Catalog $2. MATSU-MOMIJI NURSERIES, P.O. Box 11414, Philadelphia, PA 19111. (215) 722-6286.

BOOKS

1985 Edition EXOTICA 4, with 16,300 photos, 405 in color, 2,600 pages in 2 volumes, with Addenda of 1,000 Updates, by Dr. A.B. Graf, $187. TROPICA 3, revised 1986, 7,000 color photos, now 1,156 pages, $125. Exotic House Plants, 1,200 photos, $8.95. Circulars gladly sent. ROEHRS, Box 125, E. Rutherford, NJ 07073.

Out of print, scarce, and antiquarian gardening and botanical books. Catalogs issued regularly. Write to WHEELBARROW BOOKS, 22, Brangwyn Avenue, Brighton, Sussex, BN1 8XG, England.

SEND $1 FOR 24-page illustrated newsletter featuring citrus and tropical fruits, indoors and out. INDOOR CITRUS & RARE FRUIT SOCIETY, DEPT AHN, 176 Coronado Ave., Los Altos, CA 94022.

CAROL DIDRICK'S LITTLE RED BOOK ON OLD GARDEN ROSES. Where to get them and where to plant them. An introduction to OLD GARDEN ROSES. Each book signed and numbered. Send $14.95 post paid. CAROL DIDRICK, 1535 Willard Drive, Orrville, OH 44667. *Please add $2 out of country mailing.

BOTANICAL CRAFTS

DRIED FLOWERS FOR ARRANGEMENTS. Pressed flowers. Potpourris. 400 items for herbal crafting. Catalog $1 (refundable). Herbal Crafts Quarterly Newsletter $14/year. TOM THUMB WORKSHOPS-AH, Mappsville, VA 23407-0357.

BULBS

Bulbous Plant Journal, HERBERTIA and Quarterly Newsletter. Color-filled articles on bulbs, corms and tubers of Amaryllidaceae and related families. $20/yr. APLS-AH, P.O. Box 985, National City, CA 92050-0241.

CARNIVOROUS PLANTS

Carnivorous and woodland terrarium plants and supplies. Catalog FREE. PETER PAULS NURSERIES, Canandaigua, NY 14424.

CATALOGS

FREE ILLUSTRATED CATALOG OF BOOKS on plants, flowers, trees, other nature topics. Classic, hard-to-find volumes on study, identification, cultivation. Most $6 to $10. A must for horticulturists, gardeners, nature lovers. Write DOVER PUBLICATIONS, Dept. A281, East 2nd Street, Mineola, NY 11501.

DAYLILIES

Tetraploid Hybrids, Reblooming Miniatures, Dwarfs and Eyed varieties. All are hardy dormant homegrown in central Illinois' rich prairie soils. All orders are freshly dug and well packaged. KLEHM NURSERY, Rt. 5, Box 197 Penny Road, Barrington, IL 60010-9555 (1-800-553-3715).

AWARD WINNING DAYLILIES DIRECT FROM THE GROWER! ALL VARIETIES 50% OFF through September only! Color catalog $2 (deductible). DAYLILY DISCOUNTERS, Rt. 2, Box 24, Dept. AHS, Alachua, FL 32615. VISA/MASTERCARD. (904) 462-1539. "Experts recommend fall planting."

GARDENING ACCESSORIES

GOATSKIN GLOVES. Tough, lightweight, napa goatskin stretches and becomes form-fitting, giving wearer ultimate in fit, grip, dexterity. Natural lanolin in leather keeps hands soft. Sizes 7-10 or send outline of hand. $9.50 postpaid. PUTNAM'S, Box 295-AH, Wilton, NH 03086.

GREENHOUSE ACCESSORIES

COMPLETE MIST PROPAGATION SYSTEMS. Get phenomenal propagation results, indoors-outdoors. Environment sensitive controlled. FREE BROCHURES. AQUAMONITOR, Dept. 4, Box 327, Huntington, NY 11743. Tel: (516) 427-5664.

HEATHS & HEATHERS

HARDY HEATHERS FOR ALL-YEAR GARDEN COLOR! Send SASE for descriptive mail-order list. Fast Service! HEATHER GROWERS, Box 850, Elma, WA 98541.

HELP WANTED

We at the American Horticultural Society are often asked to refer individuals for significant horticultural positions around the country. We are not in a position to offer full placement services to candidates or employers. However, as a service to our members, both individuals and employers alike, we would be very glad to receive resumés and cover letters of individuals seeking job changes and employers seeking candidates. All responsibility for checking references and determining the appropriateness of both position and candidate rests with the individuals. AHS's participation in this activity is only to serve as a connecting point for members of the Society. Inquiries and informational material should be sent to: Horticultural Employment, American Horticultural Society, 7931 East Boulevard Drive, Alexandria, VA 22308.

HERBS

HERBS—Annual/perennial; extensive collection. Perennials—Large selection for sun/shade. Sedum—Tall, medium, carpeting; many varieties. Visit Living Room Gift Shop for herbal treats. Display gardens. Retail catalog $1.50; Wholesale list (Business SASE). WRENWOOD, RT. 4, BOX 361, Berkeley Springs, WV 25411.

HOSTAS

Latest Hybrids from Paul Aden. High quality containerized plants for safe all season shipping. Expertly packaged. Professionally grown. KLEHM NURSERY, Rt. 5, Box 197 Penny Road, Barrington, IL 60010-9555 (1-800-553-3715).

HOUSE PLANTS

Paying high prices for house plants, and unable to locate NEW exciting varieties? Grow them from Exotic Tropical Seeds! FREE List. SHESERA, PO Box 684-A, Clinton, WA 98236.

ORCHIDS, GESNERIADS, BEGONIAS, CACTI & SUCCULENTS. Visitors welcome. 1988-89 catalog $2. LAURAY OF SALISBURY, Rt. 41 (Undermountain Rd.), Salisbury, CT 06068. (203) 435-2263.

Exotic Houseplants, Delivered to Your Doorstep. Our 1988-90 color catalog lists 2,000 varieties of rare indoor plants. You'll find hibiscus, orchids, begonias, geraniums, heirloom, fragrant plants and more. Send $3 refundable, LOGEE'S GREENHOUSES, Dept. AH, North St., Danielson, CT 06239.

IRISES

Bearded Irises—7 mixed names $10. Postpaid color catalog $2. Many iris types. COMANCHE ACRES IRIS, Dept. AH, Gower, MO 64454.

NURSERY STOCK

Ornamental, hardy trees, shrubs, perennials. Catalog, $2. OWEN FARMS, Route 3, Box 158-A-AH, Ripley, TN 38063.

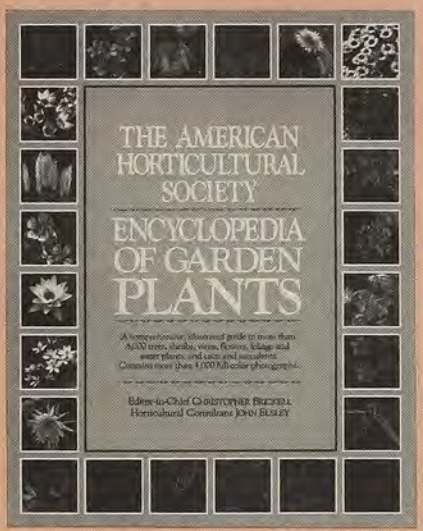
ORCHIDS

ORCHIDS! ORCHIDS! STAGHORN FERNS! BROMELIADS, BOOKS, GROWING SUPPLIES. FREE CATALOG. FOX ORCHIDS, 6615 WEST MARKHAM, LITTLE ROCK, AR 72205. (501) 663-4246.

PEONIES

Also HOSTAS, JAPANESE AND SIBERIAN IRISES, AND DAYLILIES. Current catalog $1 refundable. CAPRICE FARM NURSERY-AH, 15425 SW Pleasant Hill, Sherwood, OR 97140. (503) 625-7241.

Garden Encyclopedia



An Americanized version of *The Royal Horticultural Society Encyclopedia of Garden Plants* is to be published by Macmillan this fall under the sponsorship of the American Horticultural Society. The volume, a comprehensive, illustrated guide to the characteristics and cultivation of more than 8,000 trees, shrubs, and flowers, is being adapted for American audiences by John Elsley, assistant vice president of plant product development of the George Park Seed Co.

Estate, Hybrid, and Tree Peonies. High quality plants, freshly handled and expertly packed. Family owned company for 137 years. KLEHM NURSERY, Rt. 5, Box 197 Penny Road, Barrington, IL 60010-9555 (1-800-553-3715).

PLANTS (UNUSUAL)

RARELY OFFERED SOUTHEASTERN NATIVES, woody, herbaceous, nursery-grown. Many hardy northward. Also newly introduced exotics selected for Southern gardens. Send $.50 for extensive mail order list. WOODLANDERS AH, 1128 Colleton Ave., Aiken, SC 29801.

POSITIONS WANTED

ESTATE, UNIVERSITY, HISTORIC SITE GENERAL MANAGER. 9 years large property management experience in both private and commercial sites. Horticultural, mechanical, and cost-efficiency expert. Horticultural and management degrees. Excellent supervisor. Superior references. For resume contact Robert Bray at 914-724-5293.

PUBLICATIONS

THE BUSINESS OF HERBS. A Bimonthly Journal. Comprehensive reporting, trade news, marketing hints, personality profiles, grower resources, and more. Sample $3. Subscription $20/yr (USA). Brochure/SASE. NORTHWIND FARM, Route 2, Box 246A, Shevlin, MN 56676.

RHODODENDRONS

RHODODENDRONS for Eastern Gardens. Free descriptive listing. CARDINAL NURSERY, Rt. 1, Box 316M, State Road, NC 28676. (919) 874-2027.

ROCK GARDEN PLANTS

Rare Alpines, Wildflowers, Dwarf Conifers, Ground Covers, colorful Rock Plants, hardy Rhododendrons, Bonsai Books. Catalog $2. RICE CREEK GARDENS, 1315 66th Ave. NE, Minneapolis, MN 55432. (612) 574-1197.

ROSES

HORTICO ROSES: Hard-to-find varieties, new Austin hybrids (new English garden roses), hardy Canadian Explorer roses, and many others. Catalog listing over 350 varieties available on request at $2. HORTICO INC., 723 Robson Rd., Waterdown, ON L0R 2H0 Canada. Phone (416) 689-6984.

SEEDS

THE WORLD'S LARGEST and most famous seed catalog. Over 225 pages, 4,000 varieties, 1,000 color pictures. A major book of reference. The Encyclopedia of how and what to grow from seed. Vegetables, potted plants, exotics, perennials, alpine, rockery, latest and best annuals, trees, shrubs, bulbs from seed; includes rare items unobtainable elsewhere. Write for free copy, allowing three weeks, or enclose $2 for first class mail: THOMPSON & MORGAN, INC. Dept. AHC, P.O. Box 1308, Jackson, NJ 08527.

TETRAPLOID DAYLILIES

Over 700 hybrids, exotic new Tetraploid Introductions. Catalog $1, deductible with order of plants. SEAWRIGHT GARDENS, 134 Indian Hill, Carlisle, MA 01741. (617) 369-2172.

WILDFLOWERS

BROOKSIDE WILDFLOWERS. Nursery propagated native plants. Send $.25 stamp for our plant list. Rt. 3, Box 740-AH, Boone, NC 28607.

Hardy, easy, reliable, showy, from our nursery to your garden. For sun/shade, wet/dry, formal/naturalistic. Send $2 (descriptive 40-page catalog) or SASE (list). SUNLIGHT GARDENS, Rt. 1, Box 600-AH8, Andersonville, TN 37705.

PEONIES DAYLILIES

92-page catalog from world-famous Wild's gardens. Sensational values on more than 1300 varieties. $2 is deductible on first catalog order.

GILBERT H. WILD & SON, INC.
AH-989 Joplin Street Sarcoxie, MO 64862

Dutch Bulbs Direct From Importer...

Buy where the professionals buy!

This year, use the Van Engelen Wholesale Catalog of Bulbs to add the highest quality of flowers to next spring's garden.

Now you, too, can buy where professional gardeners shop. Send for our free catalog featuring Tulips, Daffodils, Narcissi, Crocus, Hyacinths, Iris, Muscari and many other bulbs, You'll also find Indoor Paperwhites and Amaryllis.

SPECIAL OFFER: Mammoth Darwin Hybrid Tulips—as large as 6" across! Top size, multicolored and 100% guaranteed to flower. 100 Bulbs delivered anywhere in the continental U.S.

. . . . Only $19.95

☐ Please send me a Free Catalog.
☐ Please send me Mammoth Darwin Hybrids/100.
☐ Payment enclosed $_____
☐ Charge to:
☐ Master Card ☐ Visa
Exp. Date _____
Act. No. _____
Name _____
Address _____
City _____
State _____ Zip _____

Van Engelen Inc.

Stillbrook Farm
Maple Street, 307-X, Litchfield, CT 06759

Nematodes Zap Japanese Beetles

Eastern gardeners who suffered more Japanese beetle heartbreak this year may want to experiment with using beneficial nematodes that eat the vile critters when they're in the grub stage.

Agricultural Research Service scientists in Ohio, as well as commercial companies, have been experimenting for some time with using *Heterohabditis* nematodes to reduce Japanese beetle larvae. Dr. Michael Klein of the Horticultural Insect Research lab in Wooster, Ohio, says that the nematodes have killed up to 60 percent of larvae immediately and built up enough of a population within a month to kill 90 percent of the grubs. Then they survived an Ohio winter and killed 90 percent of the remaining grubs the next spring.

Although there is already a good biological control for Japanese beetles—*Bacillus popilliae* or milky spore—it can take up to three years to become effective.

Klein said the nematodes, which kill the grubs by injecting them with lethal bacteria, appear to have comparable effectiveness throughout the country. They destroy a broader range of pests than milky spore, and are usually advertised as targeting cutworms and white grubs.

The downside is that their effectiveness against the Japanese beetle grubs varies a great deal. "In some instances, they are much faster acting than others," said Klein. And they are rarely effective for more than two years, while milky spore will remain active for 20 years or more.

Klein, who is conducting studies that he hopes will make the nematodes a more predictable foe, advised against trying the nematodes in concert with milky spore, because the two may be antagonistic. "I would use the nematodes where I needed some control right now, and the milky spore where I needed long-term control, but I wouldn't use both."

Blueberry Heaven

Four new blueberry cultivars that will extend the blueberry season from mid-June to early August have been released to nurseries and should be commercially available for planting next spring.

The blueberries were developed by Arlen D. Draper, a geneticist with the U.S. Agriculture Department's Agricultural Research Service (ARS) who retired last summer, and researchers at the New Jersey Agricultural Experiment Station.

New Jersey growers of existing blueberry varieties usually harvest them from mid-June into July.

The new cultivars are 'Sunrise', which fruits in mid-June; 'Sierra', which fruits in late June; 'Bluegold' and 'Nelson', which can be expected to fruit between mid-July and early August.

The new cultivars are all highbush blueberries, which grow six to eight feet tall and need a duration of winter chilling at 45° or below. Like most blueberries, they prefer acid soil. All are high-yielding varieties except 'Sunrise', which produces medium yields.

Gene J. Galletta, an ARS plant geneticist, said they should produce a light fruiting their third year with full harvests the fourth or fifth year.

How Much Is That Dogwood Through Our Window?

Continued from page 20

emergency subsides, then seek competitive prices. And don't give anyone a deposit." Several Washington area homeowners did so, and never saw the "workers" again, he said.

Money said many homeowners thought that, if a neighbor's tree fell on their garage, the neighbor's insurance would pay for the damage. But your insurance ends on your property line, he noted. He advised that if a neighbor does appear to have a tree that puts you at risk, you can hold their insurance company responsible for any eventual damage by sending them a registered letter to that effect. "Just explain that there are no ill feelings, but that you want to assure yourself of coverage, and most people will understand," he said.

American Horticultural Society
P.O. Box 0105, Mount Vernon, VA 22121

2ND CLASS
POSTAGE
PAID AT
ALEXANDRIA, VA
AND AT ADDITIONAL
MAILING OFFICES