

## Horticultural News and Research Important to American Gardeners

### Garden-Worthy Artemisias

Among the estimated 300 species of the genus *Artemisia* are a number of ornamentals prized by gardeners for their aromatic, silvery foliage. In order to determine the best artemisias for Midwest gardens, Richard G. Hawke, manager of the Chicago Botanic Garden's (CBG) Plant Evaluation Programs tested 26 perennial species and hybrids in a four-year comparative study.

Plants in the CBG study were rated for habit, health, cultural adaptability, and susceptibility to winter injury. Eighteen of the original 26 taxa survived all four years. Of these, only six received the highest four-star rating for superior performance. These are *Artemisia absinthium* 'Lambrook Silver', *A. alba*, *A. lactiflora*, *A. lactiflora* 'Guizhou', *A. ludoviciana* 'Valerie Finnis', and *A. schmidtiana* 'Silver Mound'. Even the highly rated plants were not completely immune to weather and less-than-perfect site conditions.

At CBG, the test subjects were planted in well-drained, compost-enriched clay loam with a pH of 7.4 in a site that received approximately 10 hours of full sun during the growing season. A weed-suppressing mulch of shredded leaves

and wood chips was applied between plants and hemlock boughs were placed over them in early November to protect the artemisias in Chicago's chilly climate (USDA Plant Hardiness Zone 6, AHS Plant Heat Zone 5). Otherwise, maintenance practices were kept to a minimum to simulate typical home garden culture.

Not surprisingly, as artemisias often hail from dry climates, many taxa proved sensitive to excessive humidity and moisture. "Silver-leaved artemisias are particularly troubled by wet soils," says Hawke. "High humidity and heavy rainfall contribute to crown melt-out in summer months and soggy winter soils can lead to root rot or even the death of the plant. A well-drained soil is the best prevention against moisture issues that affect artemisias."

The complete results of the artemisia study are published in the CBG's Plant Evaluation Notes, Issue 19, titled "Garden-Worthy Artemisias." To obtain a copy, send a check for \$3 payable to CBG to: Plant Evaluation Notes, c/o Richard Hawke, Chicago Botanic Garden, 1000 Lake Cook Road, Glencoe, IL 60022.



*Artemisia ludoviciana* 'Valerie Finnis' performed well in a four-year study at the Chicago Botanic Garden.



### BIOTERRORISM REGULATIONS INVOKED FOR PELARGONIUM DISEASE

Commercial growers of annual bedding geraniums (*Pelargonium* spp.) endured quarantines earlier this year when stricter regulations put in place to prevent bioterrorism were invoked to quell an outbreak of a prohibited strain of a fungal disease known as southern bacterial wilt.

Bedding geraniums have an unfortunate susceptibility to southern bacterial wilt (*Ralstonia solanacearum*), which is also a serious disease of agricultural crops—especially potatoes. One particular strain of the disease, known as *R.*

*solanacearum* race 3 biovar 2, was included on a list of Select Agents and Toxins prohibited under the U. S. Department of Agriculture's Agricultural Bioterrorism Act of 2002.

In late 2002, cuttings of geraniums at Goldsmith Plants' Kenya facility infected with the prohibited *Ralstonia* strain were inadvertently shipped along with other cuttings to greenhouses in Michigan and New Hampshire. From there, the cuttings were circulated to other growers throughout the country. Subse-

TOP: MICHAEL P. HARVEY/COURTESY OF CBG; BOTTOM: MARY YEE

quently, growers began noticing wilting symptoms among the plants. The severity of the problem was not recognized at first, because early symptoms of *Ralstonia* resemble those typical of bacterial blight, another fungal disease that plagues geraniums. Ultimately, the disease was correctly diagnosed, and by May 2003, 127 cases had been identified in 27 states. In cooperation with USDA, Goldsmith Plants voluntarily quarantined two stock houses in Kenya and it and other affected growers have destroyed hundreds of thousands of cuttings.

Quarantined nurseries had to wait for an agent of USDA's Animal and Plant Health Inspection Service to give them a clean bill of health. In the interim, they could not sell, groom, or take cuttings from any bedding geraniums. If infected plants were found, they were destroyed under strict quarantine protocol.

Richard Goldsmith, president of Goldsmith Plants, estimated the industry's losses because of the quarantines and plant destruction as "in the millions." To help offset these losses, Goldsmith and other affected growers are seeking USDA com-

penensation. "Given the heightened emphasis on national security, we understand why USDA had done what it has done," says Goldsmith, "but it has caused an excessive financial burden and we would like to ensure the growers involved receive fair compensation."

Goldsmith says his company and other growers are also working closely with USDA to set up more effective protocols for plant production. "It has been a big learning curve for all of us and we need to work together to find ways to ensure there is less chance of disease in our plant products," he says.

### FROG MUTATIONS LINKED TO HERBICIDE EXPOSURE

Atrazine, the most widely-used herbicide in the United States, may cause sexual abnormalities in frogs, according to Berkeley professor of endocrinology Tyrone Hayes and several colleagues. Their abstract in the *Proceedings of the National Academy of Science*, states that "at exposure levels 10,000-30,000 times beneath levels previously identified as non-toxic to frogs," frogs matured into

demasculinized adults, often with "multiple, mixed gonads."

Atrazine has been banned in most of western Europe, including Switzerland, the location of Syngenta AG, one of the world's largest producers of the chemical.

In the United States, an estimated 75 million pounds of atrazine is applied annually because it is cheap, long-lasting, and effective against both grasses and broadleaf weeds. It is particularly valued for use on corn crops because it kills weeds while, almost miraculously, leaving corn unharmed.

In 1992, after atrazine from agricultural runoff and manufacturing facilities was found in surface and ground water in the United States, the Environmental Protection Agency (EPA) limited the amount of contaminants allowed in public water supplies—the Maximum Contaminant Level (MCL)—to 0.3 parts per billion. More recently, in light of some of the new studies linking atrazine contamination to mutations in frogs and other amphibians, "new guidelines have been set for communities that are showing high risk for in ground water systems,"

## share *THE GROWING CONNECTION*

Along with several other partners, AHS and the Food and Agriculture Organization of the United Nations have launched The Growing Connection, a project designed to teach children around the world about the science behind growing food plants. Ten schools in the United States and ten schools in the West African nation Ghana will be the first growing connection.

The Growing Connection Kit contains everything a school needs to get started growing these special vegetable seeds, including project sheets that will provide directions for experimenting with the seeds that went up in a NASA science balloon.

Buy a kit for the program and your gift will be matched by EarthBox. For every three kits purchased, EarthBox will donate an additional kit. You can also make a tax-deductible gift in any amount to the program. To order or make a gift, visit the AHS Web site at [www.ahs.org](http://www.ahs.org) or call AHS at (800) 777-7931.



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AHS would like to thank the many partners who share the vision of The Growing Connection: Food and Agriculture Organization of the United Nations, National Aeronautics and Space Administration Balloon Program office, EarthBox, Rockland Teachers' Center Institute, Ball Horticultural Company, Benary, Thompson & Morgan, Seeds2000, American Takii, the governments of Ghana and China, the Pennsylvania State University, Michigan State University, and the African Development Bank.

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11 XMAS TREES	17 HYDROSEEDING	22 FLOWERING PLANT
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says EPA spokesman David Deegen. If testing shows higher than acceptable levels of atrazine in a watershed, using it will be prohibited in that area.

## RHODODENDRON ROT

When high humidity, warm temperatures, and water-logged clay soil come together, rhododendrons can succumb to root rot, a systemic disease caused by a fungus, *Phytophthora cinnamomi*. The first symptoms are yellowing of leaves—usually in only one part of the plant. New leaves may be dwarfed and shoots, stunted. Then, dieback occurs, progressing from the tip of branches downward. Root rot is always unsightly and often fatal.



Wilted and dead leaves often signal root rot.

The best offense is good, defensive care. "Maintain the health and vigor of the plant," says Michelle Bachtold, of the University of Illinois Extension. Give rhododendrons the conditions they require: acid soil, some protection from wind and sun, and—above all—moist, *well-drained* soil. Soil should be loose and allow for air penetration.

Some *Rhododendron* cultivars and species are highly resistant to root rot, including 'Caroline,' *R. davidsonianum* 'Serenade,' *R. occidentale*, *R. pseudo-chrysanthum*, and *R. poukhanense*. Others that show good resistance include 'Brickdust,' 'Disca,' 'English Roseum,' 'Rocket,' *R. aberconwayii*, *R. ponticum*, and *R. rigidum*.

The following mail-order nurseries carry these plants: **Girard Nurseries**, (440) 466-2881, [www.girardnurseries.com](http://www.girardnurseries.com);

**Greer Gardens**, (800) 548-0111, [www.greergardens.com](http://www.greergardens.com); **Rare Find Nursery**, (732) 833-0613, [www.rarefindnursery.com](http://www.rarefindnursery.com).

The American Rhododendron Society's Web site ([www.rhododendron.org](http://www.rhododendron.org)) maintains a list of the best rhododendron species and cultivars for different regions of the country.

## ORGANIC PRODUCE HIGHER IN ANTIOXIDANTS

Organic gardeners and farmers maintain that growing plants without chemical fertilizers and pesticides is better for the environment. Now, recent research by Alyson E. Mitchell of the University of California at Davis suggests that organically-grown produce contains more cancer-fighting antioxidants than conventionally grown fruits and vegetables.

Mitchell found the percentage of antioxidants in organically grown corn, strawberries, and marionberries to be between 19 and nearly 60 percent greater than in conventionally grown food.

Mitchell reasons that when insects nibble on unprotected plants, those plants produce "bitter or harsh phenolics" as a means of defense. These natural compounds also happen to enhance human health. When plants are treated with chemical pesticides, she says, production of phenolics may be inhibited.

## BACKYARD WILDLIFE HABITAT PROGRAM TURNS 30

In 1973, in response to concern that conventional landscaping practices—dominated by lawns and plants dependent on chemicals and supplemental watering—disturbed the balance of the ecosystem and contributed to a drastic reduction in wildlife habitat, the National Wildlife Federation started the Backyard Wildlife Habitat Program. For 30 years, the program has educated people about the benefits of creating and restoring natural landscapes and certified the backyards of those who put theory into practice. By April, 2003, 35,600 backyards had been certified.

To become involved in the program, order the Backyard Wildlife Habitat Kit, available for \$14.95 from the National Wildlife Federation, 1100 Wildlife Center Drive, Reston, VA 20190-5362, (800) 822-9919, [www.nwf.org](http://www.nwf.org).