

Horticultural News and Research Important to American Gardeners

WHERE THERE'S SMOKE, THERE'S...GERMINATION

In the quest to unveil the secrets of seed germination, researchers have identified various environmental stimuli and specific plant hormones that impact seed dormancy. The latest breakthrough, by an Australian research team, is the discovery of butenolide, a specific compound in smoke from burning plant tissue that induces germination in a wide range of plants. The research team that made this discovery—headed by Gavin Flematti and Emilio Ghisalberti from the University of Western Australia, Robert Trengrove from Murdoch University, and Kingsley Dixon from Kings Park and Botanic Garden—recently published its findings in the journal *Science* (August 2004).

Researchers had long known from ethnobotanical evidence that smoke—as well as heat—could stimulate germination in various plant species, but the first scientific studies correlating increased germination with exposure to smoke began only 15 years ago. “For hundreds of years, African tribes have used smoke to improve germination of red rice and maize,” says Dixon. “Scientists only recently realized what indigenous Africans have known for centuries.”

Now that butenolide has been identified, it is likely to have many practical applications in agriculture and horticulture. Plant seeds that have shown a response to butenolide range from ornamental and food plants such as coneflowers (*Echinacea* spp.) and celery to field weeds like rye grass and wild oats. One potential use, according to Dixon, could be to induce germination of dormant weed seeds in fields so weeds can be eliminated before crop planting.

Another advantage of butenolide is that it is effective at extremely low concentrations. “We have found that the compound is active at extraordinarily low levels (parts

per trillion concentrations)...this represents new frontiers in nano-stimulation of germination,” says Dixon.

The Australian research team is now directing its studies towards better understanding how the butenolide molecule behaves in agriculturally desirable and undesirable plants. The research has “potential applications to the farming, mining, landcare, and conservation management sectors,” says Dixon. “This could bring enormous benefits to many parts of the world.”

TOWARD NON-INVASIVE BUTTERFLY BUSHES

Butterfly bush (*Buddleja davidii*) is well named. Plant one in your garden and butterflies will swarm to it. Unfortunately, winglike appendages on the seeds of butterfly bushes enable them to soar far and wide and take root far from where they were planted. This tendency to stray from gardens into natural areas has put these popular ornamentals on the weed lists of several states, including Washington and Oregon.

Seeking to develop butterfly bushes that are not invasive, Jon Lindstrom, a plant scientist at the University of Arkansas–Fayetteville Department of Horticulture, is taking two approaches.

The first is to try to develop buddlejias that have “an odd number of chromosomes, because they have a tendency to be sterile.” He does this by crossing buddleja species that have four chromosomes (tetraploids), such as *B. davidii*, with those that have two chromosomes (diploids) to produce offspring that have the intermediate odd number of chromosomes.

The second approach is to modify the seed’s architecture. Lindstrom has achieved this by cross breeding *B. davidii* with *B. indica*, a species from Madagascar that has large, heavy seeds. In the first hybrid (F1) generation, seed size was intermediate between the parents. “It is unlikely, says Lindstrom, “given the size of the wingspan to the size of the seed, that seeds of the F1 would be disseminated by wind.”

Until breeding work is complete and non-invasive butterfly bush selections are



Left: A *Buddleja davidii* ‘White Bouquet’ and *B. indica* cross bred by Jon Lindstrom, assistant professor at the University of Arkansas. Below left: The large, open seed capsules of *B. davidii*. Below right: The intermediate seed capsules of a *B. davidii* and *B. indica* cross.



in the marketplace, gardeners can reduce seed spread by deadheading butterfly bush flowers once they have faded.

For those who don't already have butterfly bushes, there are plenty of other butterfly magnets to choose. Good candidates include butterflyweed (*Asclepias tuberosa*), sweet pepperbush (*Clethra alnifolia*), coneflowers (*Echinacea* spp.), Virginia sweetspire (*Itea virginica*), blazingstars (*Liatris* spp.), cardinal flower (*Lobelia cardinalis*), and New York ironweed (*Vernonia noveboracensis*).

GARDENS OF ALCATRAZ

A mere 10-minute ferry ride from San Francisco's Fisherman's Wharf, Alcatraz Island, *aka* the Rock, or Devil's Island, was, sequentially, the site of a military fortress, a Civil War prison, and, from the mid-1930s until the mid-1960s, the country's most forbidding federal maximum security prison. As such, it housed some of the most hardened and violent criminals. It was here that Al Capone, broken in solitary confinement, went mad, and here that the Birdman of Alcatraz, Robert Stroud, an



The grounds of the once infamous prison are being turned into a haven for garden plants.

expert on canaries and a savage murderer, spent 17 years.

And, surprisingly, it was here that those who peopled the island—soldiers, superintendents, families of guards, and inmates—gardened. They worked hard to coax plants to grow in a harsh environment, the wind-blown, thin, barren top-

soil of a 22-acre rocky island that is thought to be the top of a submerged mountain. Over 150 years, the efforts of these early gardeners ensured that some 140 garden plants naturalized on the island.

Now the Garden Conservancy (GC), in partnership with the Golden Gate National Recreation Area (National Park Ser-

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vice) and the Golden Gate National Parks Conservancy, is restoring key gardens on Alcatraz. “The Garden Conservancy wanted to strengthen the entire program in California and needed a signature preservation project,” says Bill Noble, director of GC Preservation Projects. “Alcatraz came up.”

Overseeing the project will be Carola Ashford, the newly appointed recipient of the GC’s sixth annual Marco Polo Stufano Garden Conservancy Fellowship. According to Noble, Ashford is a landscape architect with a degree in criminology. “She impressed us as being a leader in the field of public horticulture in the Bay Area,” says Noble.

One of the most popular tourist attractions in San Francisco, Alcatraz draws approximately 1.3 million visitors a year. Restoring Alcatraz’s gardens will add to the visitor experience, says Noble, because “the entire journey up to the cell house is through gardens and areas that were once gardenized.”

For more information about the Garden Conservancy and its programs, visit www.gardenconservancy.org.

2005 PHS GOLD MEDAL PLANTS

The Pennsylvania Horticultural Society (PHS) has announced the four exceptional plants awarded the PHS’s Gold Medal for 2005, bringing the total number of plants honored in this way to more than 75 since the Gold Medal Plant Award program debuted in 1978.

The goal of the Gold Medal program is to promote worthy ornamental woody plants suited to the growing region from New York to Washington, D.C., that are little-known or underused. Home gardeners, garden designers, horticulturists, landscape architects, and nursery owners submit candidates for each year’s award. A group of nursery owners and horticultural professionals then evaluate the nominees for garden performance and hardiness.

This year’s winners are:

Korean fir (*Abies koreana*) is a heat-tolerant pyramidal evergreen tree that reaches 25 feet high with short needles, green on top and silver below. Dark violet cones in spring give the impression of flowers. USDA Zones 5–7, AHS Zones 7–5.

‘Michael Lindsey’ Carolina allspice (*Calycanthus floridus*) is an adaptable, trouble-free selection of a native shrub

with fragrant early summer flowers and bright yellow fall color. Reaches seven feet tall and wide. Zones 5–9, 9–1.

‘Margarita’ Carolina jessamine (*Gelsemium sempervirens*) is a drought-tolerant, deer-resistant evergreen vine that covers itself with fragrant yellow flowers in spring. It grows about 12 feet high, adapts to most soils, is tolerant of part-shade. Zones 5–9, 9–4.

‘Winter Gold’ Winterberry (*Ilex verticillata*) has berries that are a welcome shade of orange yellow on a native shrub, tolerant of less than well-drained, acid soil. The male winterberries, ‘Southern Gentleman’ or ‘Apollo’ will pollinate ‘Winter Gold’. It grows to seven feet high and wide. Zones 4–8, 8–2.

For plant profiles and sources, visit www.goldmedalplants.org, or send a 60-cent self-addressed-stamped envelope to Gold Medal Plants c/o PHS, 100 N. 20th Street, Philadelphia, PA 19103.

VOODOO LILY WINS FOLIAGE AWARD

With a spectacular six-foot single leaf on a six-foot green-and-pink-marbled stem spotted with white dots, a voodoo lily (*Amorphophallus konjac*) (formerly known as *A. rivieri* var. *konjac*) from Worldwide Orchids of Apopka, Florida, won the award for “Foliage and Tropical Potted Plants Best New Product” at the Super Floral show, held this past June in Charlotte, North Carolina.

In mature plants, a huge inflorescence rises from the corm, whether or not it has been planted in soil. The flower may measure up to six feet tall with a three-foot spadix and a vase-shaped purple spathe. Perhaps the most remarkable feature of this flower is a dead-meat odor that can bring tears to the eyes. The striking foliage of the voodoo lily doesn’t appear until a month or more thereafter.

In flower or foliage, the voodoo lily looks like an escapee from the rain forest, but Ron McHatton, director of horticulture at Worldwide Orchids, says it has been known to survive in the ground to as far north as Wichita, Kansas (USDA Zone 5). “It’s very tough—easily a USDA Zone 6 plant,” says McHatton. “It grows from Japan throughout Southeast Asia and mainland China.”

Voodoo lilies thrive in part shade to full sun. In climates colder than USDA



The odd and tropical-looking voodoo lily—in flower, left, and in foliage, right—is surprisingly hardy.

Zone 6, a heavy mulch will usually protect the winter-dormant corm. “The corms are sensitive to winter wet,” says McHatton. “Drainage is key; amend the soil so they don’t sit in water—or dig them like dahlias.”

Mature corms can weigh as much as 25 pounds. In addition to being sold as voodoo lilies, the corms are used to produce Glucomannan, a 100-percent dietary fiber source that contains no calories and is used for weight-loss diets.

One retail mail-order source for voodoo lilies is Plant Delights Nursery in Raleigh, North Carolina, (919) 772-4794, www.plantdelights.com.

GEOGRAPHY AFFECTS HOW WE GARDEN

Who you are, what you earn, and where you live affect how you garden. Such are the findings of a survey of American gardeners, conducted from June 8 through June 13, 2004, and sponsored by the Garden Writers of America. After 1001 computer-assisted telephone interviews were taken with numbers by region reflecting population, the data were weighted by gender, age, and race to reflect census.

Some of the results were to be expected. For example, ease of use of hand tools was more important than price in the 65-and-over age group. And the durability of hand tools was more important than price for wealthier respondents who also spend more money on fertilizers than

groups at lower income levels.

Similarly, it is no surprise that Westerners were the least likely group to depend upon rainfall for watering needs and were almost twice as likely to install water-conserving irrigation. Unexpected was the finding that divorcees and singles are the people most likely not to conserve water.

Along with Southerners, western gardeners are also less likely to address insect problems than either Midwesterners or Northeasterners. Midwesterners, who freeze and preserve the vegetables they grow more than other groups, use more chemical products than any other region.

Most surprising is that Northeasterners, the least likely to fertilize, are only half as likely to donate the vegetables they grow to others.

COLD-HARDY CLEMATIS

Uno Kivistik may not be a household name just yet in North America, but the breeding work on cold-hardy clematis done by the late Estonian plant breeder and his family is starting to make news on this continent.



Clematis Piilu™ from the Kivistik collection

Kivistik and his wife, Aili, ran a family farm in Estonia, breeding ornamental plants in their spare time from farming. In the last quarter century, Kivistik, who died in 1998, focused on clematis, collecting some 23 species from around the Baltic countries and the Soviet Union. These became the basis of a breeding program that has yielded more than 6,000 hybrids and 140 cultivars.

Developed on the farm, which is north of the 58th parallel (equivalent to

southern Alaska and northern Newfoundland), these clematis cultivars are attracting attention not just for their amazing hardiness, but for their compactness and beauty. They are also proving quite heat tolerant, surviving the heat and humidity at Roseville Farms nursery in Apopka, Florida, which is the major licensed producer of the Kivistik clematis in North America.

A lovely example of the Kivistik Collection is *Clematis Piilu*™ ('Little Duckling'), an all-summer, big-flowered, heavy bloomer that begins producing its two-toned pink flowers at one year old. The earliest flowers are doubles. Later flowers are singles, but plentiful and carried on a plant that tops off at about six feet and thrives in Zones 2 to 8, 8 to 2.

One retail mail-order source for the Kivistik Collection is Completely Clematis, Ipswich, Massachusetts, (978) 356-3197, www.clematisnursery.com.

Associate Editor Carole Ottesen and Editorial Intern Jessie Keith contributed articles for this section.

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