



Venus produces “ginormous” floral bracts, usually 6–7 inches across — sometimes even bigger. PHOTO BY THOMAS MOLNAR

# A dogged approach to dogwoods

**Years of research have yielded hardier, more decorative *Cornus* hybrids**

Many are the reasons to love Venus Dogwood (pictured above). As gorgeous as its namesake, Venus is resplendent with blooms of pure snow white in late spring. Fast-growing to 15–20 feet, this selection from Rutgers University has outstanding winter hardiness, good tolerance of drought conditions and is highly resistant to disease. PHOTO BY THOMAS MOLNAR

**By Elizabeth Petersen**

Dr. Elwin Orton started a long, successful career breeding better plants at Rutgers University in 1960. When he retired from the university 48 years later, he had explored new avenues of investigation, changed the nursery “landscape” across the country, and saved the dogwoods.

Orton’s early efforts at Rutgers targeted holly, combining the winter hardiness of *Ilex opaca* with the ornamental characteristics of *I. aquifolium* to produce better foliage and berries for the cut sprig market. His work eventually included 18 different *Ilex* species.

“But man cannot live by *Ilex* alone,” Orton said.

*Cornus florida*, the iconic native flowering dogwood of the East Coast, was under attack by the dogwood

borer. “Some growers used to spray for the borer three or four times a year with DDT,” Orton said.

Powdery mildew was a problem for dogwoods, too. In the 1970s, dogwood anthracnose, a disease caused by the fungus *Discula destructiva*, compounded the difficulties. Both *C. florida* on the East Coast and *C. nuttallii*, the Pacific dogwood native to the West Coast, were falling victim. “Some thought it might be the end of the native dogwoods,” Orton said.

Instead, he expanded his breeding to search for dogwoods capable of withstanding insects and disease.

## The big idea

Orton had a novel idea to save the native American dogwoods. He focused on a dogwood native to

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Asia, *C. kousa*, a species with superior resistance to pests and disease.

A successful cross between *C. florida* and *C. kousa* had never been accomplished, and the two species bloomed a month apart: *C. florida* in early May and *C. kousa* in early June.

Undeterred, Orton started assembling all dogwoods available in the trade. Since dogwoods are self-incompatible, a “tremendous genetic variability exists in each species,” Orton explained. Selections can be made for shape, vigor, size, brighter white bracts, red bracts or bracts tinged with pink. With more variation in the parent plants, he could expect more variability from the crosses.

Orton collected pollen from earlier blooming *C. florida* trees and stored it at zero F. When *C. kousa* bloomed a month later, he warmed up the pol-



Elwin Orton, a researcher at Rutgers University, was responsible for breeding and introducing new native dogwoods that could better withstand attacks from insects and pathogens.

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len and manually pollinated those trees using a toothpick.

Since dogwoods mature slowly, after five to seven years as juveniles, the selection process was very slow. Years of trials involving thousands of hybrid seedling dogwood crosses proved worth the time and effort.

After a quarter century evaluating experimental hybrid trees in various climates, retesting new hybrid trees with old standard dogwoods, and reconfirming performance, the first group of Orton's interspecific dogwood crosses, the Stellar series, reached the market in the early 1990s.

Highly resistant to dogwood borer, with significantly improved resistance to powdery mildew and dogwood anthracnose, and better drought tolerance, these selections ushered in a new era for dogwoods in the landscape and nursery industries.

Trees in the series bloom midway between the two parent species.

Although the U.S. plant patents have now expired on Aurora, Constellation, Celestial, Stellar Pink, Stardust and Ruth Ellen, they are still trademarked and sell well across the country.

"Stellar Pink with pink bracts has always been the leader in sales," Orton said.

Orton also discovered a true genetic dwarf form of *C. florida*, which was named Red Pygmy® (*C. florida* 'Rutnut') and released to the commercial market in 1993. A shrub form for small spaces, Red Pygmy produces typical *C. florida* flowers that are dark pink to red on a much smaller plant. Dense branching and side branches together produce a mounded effect.

According to Eric Hammond, production manager of Heritage Seedlings in Salem, Oregon, Red Pygmy is very popular on the East Coast where it performs admirably. Its showy golden orange fruit makes an outstanding display.

#### Another big idea

What about crossing *C. kousa* with *C. nuttallii*? Such crosses might also pro- ▶

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Little Ruby flowering dogwood is the first new hybrid dogwood to be released from a breeding program headed up by Thomas Ranney at North Carolina State University.

PHOTO COURTESY OF NORTH CAROLINA NURSERY AND LANDSCAPE ASSOCIATION

duce good results, Orton hypothesized.

He was right. After years of hybridizing and field testing, the hybrid Jersey Star® series of crosses using F1 *C. kousa* and *C. nuttallii* seedlings was released by Rutgers in 2004. These new varieties, Venus® (*Cornus* × ‘KN30-8’) and Starlight® (*Cornus* × ‘KN4-43’), took dogwoods to a new level. Both are extraordinarily robust and distinguished by very large, attractive white flowers.

Venus produces huge floral bracts, usually 6–7 inches across — sometimes even bigger.

“The ginormous flowers are phenomenally beautiful,” Hammond said, and the trees have great vigor and disease resistance.

J. Frank Schmidt & Son in Boring, Oregon, grows dogwoods from Orton’s work at Rutgers and others of interest.

Communications director Nancy Buley finds the *C. kousa* and *C. nuttallii* crosses of particular interest for sites in the Pacific Northwest and very popular in other regions of the country, too.

“We were the first to trial these new cultivars in the Northwest, and they were identified only with a numbered code name,” Buley said. “When they bloomed for the first time — wow! — we knew this tree was a winner.”

The huge bracts make Venus very showy in bloom, making it the runaway best seller of all the Rutgers hybrids, she added. As many Venus dogwoods are grown as all of the other Rutgers hybrids combined. The plant grows vigorously with low branching that forms a rounded head that is wider than tall.

The other Jersey Star selection, Starlight, more closely resembles the native Pacific dogwood. Buley finds

that its upright form, with a strong central leader and dense branching, makes it well suited for street and commercial use. Both have excellent resistance to disease. In fact, according to the Rutgers website, Starlight is so healthy that “no insect or disease problems have been observed during the almost 30 years since the original hybrid tree was planted.”

Sparse fruit production adds to the desirability of Starlight as a commercial landscape tree, Buley said, as evidenced by its use in a recessed courtyard of the newly remodeled Edith Green/Wendall Wyatt Federal Building in Portland, Oregon. Venus dogwoods also produce little to no fruits.

### The work continues

Dr. Tom Molnar joined the team at Rutgers in 2005 and took over con- ▶

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*Cornus kousa* 'Satomi', also known as 'Miss Satomi', is a longtime favorite due to its clusters of tiny pink flowers.  
PHOTO COURTESY OF JOY CREEK NURSERY

trol of dogwood breeding when Orton retired in 2008.

An associate professor in the Department of Plant Biology and Pathology, Molnar continues to work towards the same goals that guided Orton.

"In 2005, we started making crosses on many different unreleased hybrids and species dogwoods to develop large populations of new and unique plants to select from and to use in later generations of breeding," Molnar said.

"I have been cycling through many thousands of dogwoods. Our goals are focused on developing dark-pink and red-bracted *C. kousa* and hybrid dogwoods. We are also stressing powdery mildew resistance, great dark green leaf colors and textures, early production of floral buds and large bracts."

While Orton might not have developed a true red-bracted *C. kousa*, he built an amazing legacy of breeding parents to use for future improvement efforts. "I consider myself very lucky to have his over 40 years of dogwood breeding

— some pedigree records go back four and five generations — to support our continual effort today," Molnar said.

Orton's new release, Rosy Teacups®, has attractive medium-pink bracts. Hammond described it as a "very fine hybrid from Dr. Orton" and added that the *C. kousa* × *C. nuttallii* hybrid is superior to any reds on the market.

A favorite at Heritage Seedlings, "Rosy Teacups has great vigor, disease resistance and bracts that are consistently pink." According to Hammond, the consistency is an improvement over another pink, *C. kousa* 'Satomi', that has been a top seller for decades. The pink of Satomi's bracts is more variable depending on specific annual conditions, whereas Rosy Teacups performs consistently.

In the breeding pipeline, "We are now two generations beyond Rosy Teacups and we expect more amazing dogwoods synonymous with the Orton name for years to come," Molnar said. "The next few years will be very exciting as we see our newest generations

of plants start to flower!"

Meanwhile in North Carolina, recent dogwood breeding has been supported by a partnership between North Carolina State University (NCSU) and the North Carolina Nursery and Landscape Association (NCNLA).

"Our work has been taking a different angle," according to Dr. Thomas Ranney, professor in the Department of Horticultural Science at NCSU. Researchers there have been experimenting with many different evergreen dogwood species including *C. hongkongensis*.

"The evergreen species tend to contribute great foliage quality, disease resistance, heat tolerance, and the capacity to root more easily from cuttings. By hybridizing these with more cold-hardy deciduous species including *C. kousa*, we can get the best of both worlds," Ranney said.

Little Ruby™, the first hybrid dogwood to be released, is a great example. A compact plant that can be grown as a shrub or tree, Little

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Ruby has excellent disease resistance and roots from cuttings. Pink flowers vary from single to double (with extra bracts), and the foliage has an attractive red blush in summer then turns a brilliant maroon in fall and winter. It is semi-evergreen to 15 F.

"In the future, we will work on developing more compact, evergreen shrub forms with good cold hardiness and a range of bract colors," Ranney said. "We think there is real potential to reinvent dogwoods for completely new landscape niches."

**Production in Oregon**

Oregon growers can attest to the value of the breeding work done by these researchers. At Heritage Seedlings, for instance, "We grow a lot of dogwoods, which go out all over the country, the majority to the East and Northeast," Hammond said. "We have grown everything that Dr. Orton has released, and he did a fantastic job trialing his selections."

Even during the economic downturn that hit growers so hard, dogwoods "did not fall off on sales like other trees did," Hammond said. "My theory is that they fit in gardens well and they are easy to grow. Gardeners find dogwoods accessible, and they are comfortable with general cultural knowledge about them. Even those who don't garden are familiar with dogwoods."

Production nurseries have to discover and define the differences among selections, Hammond said. Consequently, Heritage has quit producing Aurora, which it found to be somewhat brittle. Likewise, Heritage tried the newer Hyperion, but is dropping it in favor of Venus, which is very similar but "has a better name."

Heritage raises many dogwood species and budded hybrids of which *C. kousa* rootstock and seedlings are in high demand.

*C. kousa* 'Summer Gold', a selection discovered by Crispin Silva of Crispin's Creations Nursery, is notable for its extraordinary gold and green ▶



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variegated foliage.

Hammond also recommended a new selection of *C. elliptica* for more mild areas — Empress of China (*C. e.* 'ELSBRY'), which is hardy to USDA Zone 7. Popular in the Southeast and California, the vigorous evergreen selection blooms in late summer.

A J. Frank Schmidt introduction from still another species, *C. controversa* 'June Snow-JFS', has been gaining acceptance and popularity. Reminiscent of the layered Pagoda Dogwood (*C. alternifolia*), June Snow™ is bigger and more vigorous with an attractive, spreading structure. Even in winter, the tree has loads of character thanks to its alternately layered branching habit that resembles the popular, but difficult-to-grow, wedding cake tree (*C. controversa* 'Variegata').

Large (5–6 inches), flat-topped flower heads made of many tiny flowers, rather than bracts, smother the lateral branches “like sea foam” in the spring, Buley said. These are followed by tiny, attractive, black-purple fruits that are favored by birds.

With clean, disease-resistant foliage, June Snow is handsome in all seasons, its exceptional fall color and red/purple brown bark and stems decorating the tree in fall and winter.

June Snow was chosen as a Great Plant Pick for its performance in Pacific Northwest gardens, as was another dogwood recommended by Buley — *C. kousa* var. *chinensis* 'Milky Way'.

This selection also boasts an “amazing spring flower display,” during which branches are smothered with star-shaped floral bracts that open lime green and quickly change to creamy white. Bright red, strawberry-like fruit decorate the tree until fall, when striking red leaves finish up the seasonal show. ☺

*Elizabeth Petersen writes for the garden industry and teaches SAT/ACT test prep at [www.satpreppdx.com](http://www.satpreppdx.com). She can be reached at [gardenwrite@comcast.net](mailto:gardenwrite@comcast.net) or [satpreppdx@comcast.net](mailto:satpreppdx@comcast.net).*

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