

Horticultural News and Research Important to American Gardeners



ORNAMENTAL ALLIUM IS 2018 PERENNIAL PLANT OF THE YEAR

The Perennial Plant Association (PPA) has named *Allium* 'Millenium', shown above, as its 2018 Perennial Plant of the Year. This ornamental onion cultivar distinguishes itself with its easy-going nature and season-long good looks. Hardy to USDA Hardiness Zones 3 or 4, 'Millenium' produces neat clumps of grasslike foliage reaching between 10 to 15 inches tall. Spherical rose-purple blooms appear in mid- to late summer and last up to four weeks, drawing pollinators. It thrives in full sun, but will benefit from afternoon shade in regions with hotter climates.

Once established, 'Millenium' is drought-tolerant. Insect pests and deer don't bother it. And unlike some ornamental alliums, 'Millenium' self-sows at a manageable rate. The PPA recommends pairing this cultivar with shorter goldenrods (*Solidago* spp.) or with plants with silvery foliage for striking color contrasts.

Find out more about 'Millenium' and the PPA's Perennial Plant of the Year program at www.perennialplant.org.

STUDY IDENTIFIES NATIVE OAKS AT RISK

Around the globe, oaks (*Quercus* spp.) are key ecosystem species that a myriad of other species depend upon for survival. However, factors such as habitat destruction, climate change, and invasive pests have caused many oak populations to decline to the point of becoming threatened. In the United States, almost a quarter of its native oak species are of "conservation concern," according to a recently published report by the Morton Arboretum in Lisle, Illinois. The report is part of the "Red List of Threatened Species" series of the International Union for Conservation of Nature (IUCN), aimed at identifying flora and fauna most in need of intervention to prevent extinction.

The good news is that none of the 91 American native oak species have gone extinct yet, but three—*Q. boyntonii*, *Q. graciliformis*, and *Q. hinckleyi*—are considered



A Morton Arboretum scientist holds a twig of critically endangered *Quercus boyntonii*.

critically endangered, meaning they have a very high risk of disappearing in the wild. These and the other 13 native oak species identified as threatened are all endemic to the southern and western portions of the country. While climate change is the biggest threat to native oak species overall, most populations are healthy enough to avoid a

"conservation concern" label. Other factors impacting already-vulnerable species include wildfires, land use changes, invasive pests, and logging.

To read the full report, visit www.mortonarb.org/files/Oaks5.pdf.

HALO EFFECT HELPS BEES FIND FLOWERS

Have you ever noticed a slight blue glow around certain flowers? Probably not, because this "halo" occurs mainly in the ultraviolet (UV) portion of the spectrum, which is not visible to humans. Scientists studying the microscopic structure of flower petals recently discovered what creates this halo and why. The researchers—from the University of Cambridge, the Royal Botanic Gardens Kew, and the Adolphe Merkle Institute at the University of Fribourg, Switzerland—were curious about whether there was an explanation for the irregular structures on the surface of some petals, or if, as senior author Beverly Glover put it, they were there because the "flowers couldn't do any better."

The research team found that the asymmetric petal grooves scatter UV light in a way that bees see as a blue halo. To test the impact of the flower "halo effect," the researchers conducted experiments with artificial surfaces and bumblebees. The bumblebees were able to more quickly locate surfaces that produced the halo, regardless of the actual surface pigmentation.

Interestingly, one of the research team's conclusions is that different plant species arrived at this same adaptation over time, a phenomenon known as "convergent evolution." The scientists found that development of these "messy" ridges on petals coincided with the rise of pollinating insects, around 100 million years ago. Plants that use this technique include Chilean evening primrose (*Oenothera stricta*), Namakwa daisy (*Ursinia speciosa*), and flower-of-an-hour (*Hibiscus trionum*).

You can learn more about this research at www.cam.ac.uk/research/news.

GENE-EDITING TECHNOLOGY USED TO CHANGE FLOWER COLOR

In what has been reported as a milestone in ornamental plant breeding, a Japanese research team has used a newer genome-editing process to create a white-flowered version of the common Japanese morning glory (*Ipomoea nil*). The re-



searchers used a tool called CRISPR, which stands for Clustered Regularly Interspaced Short Palindromic Repeats. The process involves using an enzyme to slice and remove

a specific section of the DNA sequence that controls production of anthocyanin, the pigment that gives morning glory flowers their normal pink to purple coloring.

Although the color change achieved in this experiment is not intended to wow gardeners or create a new plant introduction, scientists indicate the study has broader

implications for the efficacy of using this

Researchers used CRISPR technology to remove the genes that make Japanese morning glory flowers purple, resulting in a version that produces white flowers.

gene-editing technology to alter not only flower color but other

physiologic factors in a wide array of plants.

You can read more about the experiment at www.nature.com/articles/s41598-017-10715-1.

HELP HARVARD'S ARBORETUM IMPROVE PLANT IMAGE LIBRARY

The Arnold Arboretum of Harvard University in Boston, Massachusetts, is home to a diverse collection of 15,000 plants from around the world. It holds thousands of contemporary and historic images of this collection, available on the arboretum's website. Now it has launched "TreeVersity," a crowd sourced project to add "tags"—terms that describe what's in the image—to improve the searchability of its plant image database.

TreeVersity volunteers can follow a simple tutorial, then for each image, they can select terms from a list of plant parts such as bark, trunk, and fruits/seeds. If insects, birds, or plant health issues are visible, these can be tagged as well. The goal is to make this resource more widely useful for plant identification and other purposes to researchers, educators, botanical garden staff, and the general public. To get involved in TreeVersity, visit www.zooniverse.org/projects/friedmaw/treeversity.

News written by Editorial Intern Aaron Dorman and Associate Editor Viveka Neveln.

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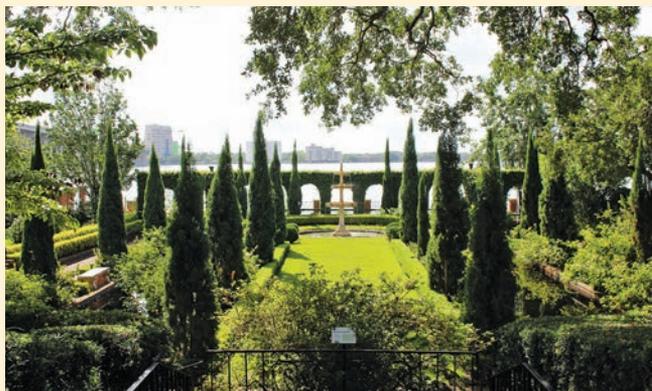
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HURRICANE DAMAGE UPDATE FOR RECIPROCAL ADMISSIONS PROGRAM GARDENS



The Italian Garden at the Cummer Museum of Art & Gardens, above, suffered extensive flooding and wind damage from Hurricane Irma, left.

Along with the homes and businesses devastated by Hurricanes Harvey, Irma, and Maria this past summer, several botanical gardens and other public green spaces in the Southeast and Gulf Coast also sustained a great deal of damage. According to the American Public Gardens Association, “These hurricanes have dealt devastating blows to unique and historic plant collections that are invaluable to the mission of conserving and inspiring the protection of plant biodiversity for future generations.” Here is an update on the affected places that participate in the American Horticultural Society’s Reciprocal Admissions Program (RAP).

Two RAP gardens in the Houston, Texas, area—**Mercer Botanic Gardens** and **Shangri La Botanical Gardens and Nature Center**—are among the hardest hit. Both remain closed after heavy flooding and strong winds from Hurricane Harvey. Mercer is trying to purchase acreage on higher ground and relocate greenhouses. Similarly, the grounds of the **Cummer Museum of Art & Gardens** in Jacksonville, Florida, are closed indefinitely because flooding from Irma destroyed much of the soil, plantings, and infrastructure.

Other gardens in Florida suffered extensive tree losses and damage. **Fairchild Tropical Botanic Gardens** in Coral Gables lost

about 20 percent of its tree collection. **Mounts Botanical Garden** in the Palm Beach area estimates that a quarter of its tree canopy was damaged. At **Fleming Gardens** in Davie, the storm brought down a number of trees, including two Florida Champion Trees (tallest of their species in the state): a korina tree (*Terminalia superba*) and an American oil palm (*Elaeis oleifera*). The Har-



The recent hurricanes toppled many large trees, such as this one at Mounts Botanical Garden.

ry P. Leu Gardens in Orlando lost 175 trees, and a large limb damaged the roof of the historic house there.

Several more Florida gardens impacted by Irma are fully operational again but still clearing debris and in need of volunteers, supplies, and funds to assist with reconstruction efforts. These include **Bok Tower Gardens** in central Florida, **Heathcote Botanical Gardens** in Fort Pierce, **Jacksonville Arboretum & Gardens**, **Marie Selby Botanical Gardens** in Sarasota, and **Miami Beach Botanical Gardens**.



Volunteers at Fairchild Tropical Botanic Gardens help clear debris.

In Georgia, **Massee Lane Gardens** (see article on page 40) and **Lockerly Arboretum** are also undergoing storm cleanup but have opened to the public again. Outside of the mainland United States, the **St. George Village Botanical Garden** on St. Croix (Virgin Islands) was in the path of both hurricanes Irma and Maria, taking most damage from the latter, which brought down many of its trees, especially palms.

For more information about ongoing recovery efforts at these gardens, or to find out how you can help, visit www.ahsgardening.org/rap.

—Aaron Dorman, Editorial Intern