FALL 2019

The DIG & grow

COURSE CATALOG

norfolk botanical garden

From the President

Printed on 100% recycled paper.

Think about the last time you interacted with a plant. Can't remember? How about nearly every second of your day. When you woke up you went to your bathroom and probably used a paper product or cotton fabric. Your breakfast beverage was most certainly plant–based, be it OJ, coffee or tea. Breakfast was plant-based cereals, grains or an animal product like eggs that were enriched and fed by plants. Your wardrobe probably had cotton in it, or if it was synthetic, was derived from petrochemicals which are the results of algae that degraded millions of years ago (technically not a plant but you get my point).

Plants touch every part of our daily lives--they are the basis of life. Connecting people to nature through the world of plants is our passion at Norfolk Botanical Garden. To guide us in that passion, our volunteer Board of Directors has worked hard over the past few months to update our Strategic Plan for 2019 - 2022. I'm proud to share its 5 points with you now:

1. Lead in Environmental Action and Advocacy
2. Deepen the Garden's Engagement with – and Impact in – the Community
3. Provide a Dynamic, High Quality and Welcoming Experience that Connects People to Nature
4. Ensure Long-term Financial Sustainability
5. Maintain Organizational Leadership Excellence

The Board also felt that it was time to update our mission statement which previously read:

> The mission of Norfolk Botanical Garden is to enrich life by promoting the enjoyment of plants and the environment through beautiful gardens and educational programs.

Our new mission statement speaks of action and leadership:

Norfolk Botanical Garden-

> Immerses visitors in a world of beauty
>
> Leads through environmental action
>
> Inspires through education and connection to nature

Speaking of action, NBG became 100% renewable as of July 1st of this year. Staff had voted this as their number one winning idea from a staff-wide contest of ideas. I'm proud to say we delivered on their idea and now offset all of our electricity use with renewable energy credits (RECs) through Dominion Energy. You too can join us by switching to RECs through Dominion Energy or Arcadia Power. Action is critical to solving the environmental crisis we face. NBG is committed to being there to immerse, lead and inspire our visitors to act and change for a greener world.

contents

Ancient Fall Color

Les Parks, Director of Horticulture

In the gardening world, trees are often lauded for having reliable fall color, meaning no matter what variables the weather subjects them to they always put on a great show. However, there are several that take the term reliable to a whole other level. One of our favorites is the bald cypress (*Taxodium distichum*). A fall walk along the causeway in Mirror Lake lets you appreciate its delicate fern-like foliage and handsome russet orange color. Bald cypress trees hold a reputation for being some of the longest-lived trees in the world. Recently, one was discovered along the Black River in North Carolina to be over 2,600 years old!

Another great tree for fall color is the dawn redwood (*Metasequoia glyptostroboides*), which before the 1940s was known only by its fossils and thought to have been extinct for millions of years. That changed when a small population of the tree was discovered in China. Its seeds were saved and brought to this country by the Arnold Arboretum, and now the tree thrives in gardens around the world, gracing them with beautiful red-orange color in the fall. Here at NBG our favorite is the pair we know as *The Bride and Groom*. Located in Discovery Grove, they are an apt symbol of hope for a long and happy marriage.

Ginkgoes (*Ginkgo biloba*) probably take the prize for reliable fall color. Each tree's leaves progress towards peak golden yellow color in unison, then once reached, fall to the ground together creating a brilliant carpet underneath. Each year, members in the know watch for the ginkgo in The Glade to make its spectacular turn and shower the ground. Ginkgoes are also some of the world's toughest, longest lived trees, with many living specimens measured in centuries, not years. They are also one of the oldest tree species on earth, and have been putting on glorious fall shows for 270 million years. It is unclear if the dinosaurs ever appreciated such display.

VISIT, VOTE & BID

This past summer we connected children with nature by encouraging them to see their home as a habitat and to think of the vital role plants play in proving food, shelter and just about everything that helps us live happy and healthy lives. With that theme in mind, Barkitecture, a fun and educational exhibit for all ages (human and canine), includes over 30 custom designed doghouses worthy of the most pampered pooch. Through October 15th, families can embark on a journey through the Enchanted Forest, choose their favorite house, and vote for the winning design team. Select doghouses are available for purchase through an online auction. Money raised will benefit the Garden and other local charities. Visit NBGbark.org to place your bids.

BARKITECTURE 2019

Designer Doghouses at NBG

PRESENTED BY CAPITAL GROUP®

Canine Cabana - designed Siska Aurand Landscape Architects, Inc. and built by JM Sykes Inc.

Sunday, September 8TH & October 13TH
12 — 6 PM

Enjoy music, food, beer and dog-friendly vendors for the last two Barks & Brews events of the year. Sponsored by O'Connor Brewing Company.

Camellia Society Show & Sale

Included with Garden Admission

Saturday, Nov. 2nd • 10 AM — 4 PM

ART in BAKER HALL

Included with Garden Admission

A Sense of Place
SEPT. 1 — OCT. 31

Oil Paintings by Barbara Hart

Chinese Watercolor & Acrylics
NOV. 1 — DEC. 31

Various artists SumiE Society, Blue Heron Chapter

Longleaf Pine Restoration

Thanks to a generous gift from IKEA we now have the opportunity to expand the plant communities in the VA Native Plant Garden to recreate a native Virginia forest. We're particularly excited to expand our Longleaf Pine collection, a unique forest whose northern range ends here in southern Virginia. Longleaf pine, *Pinus palustris*, is also known as the tree that built Tidewater because of its impact in establishing our coastal port system. Once ubiquitous from here to Texas, its overall population has been drastically reduced. In Virginia, longleaf pine was once the most common pine covering around 200,000 acres. Today, fewer than 200 mature trees remain in small natural areas about 50 miles west of Norfolk in the counties of Isle of Wright, Southhampton and the City of Suffolk.

In order to create ideal growing conditions for this tree and its natural companion plants, we need to thin the existing loblolly pine, *Pinus taeda*, and its overstory. This means we will remove many large loblolly pines as well as numerous smaller ones to allow for more sunlight to reach the forest floor. This is planned for late summer/fall 2019.

Tree thinning is an important and common forest management practice. It allows newly planted trees to grow faster and stronger because there is reduced competition for water, sunlight and nutrients. With the increase in sunlight to the forest floor, newly planted native wildflowers and shrubs will also flourish.

Longleaf pine forests are among the most diverse ecosystems in the world, supporting a vast array of wildlife. It is important to us that we represent our natural forest communities as accurately as possible with healthy, thriving plant specimens. Longleaf pines are incredibly resilient with a considerable track record of surviving hurricanes and severe weather. They are also expected to better withstand the changes brought on by climate change. We will also plant other native tree species such as Tupelo, *Nyssa spp.*, and Bald Cypress, *Taxodium distichum*.

We hope you will visit the renewed VA Native Plant Garden & Forest often to see the progress of this important reforestation project.

The Garden partnered with the Virginia Department of Forestry this past spring and handed out over 2,000 VA stock longleaf pine trees to Garden guests. It was our call to action to encourage guests to plant a tree and make a positive impact on the environment and offset deforestation. If you planted a longleaf pine in your yard let us know how your tree is progressing. Email a photo to marketing@nbgs.org, post to Facebook or tag us on Instagram.

Community Connections

This past summer, we shared our plant enthusiasm with more than 2,500 children through educational field trips. We participated in various festivals and donated native plants for local stewardship projects – all while sharing our mission of environmental action and connecting communities with nature.

FuseFest 2019

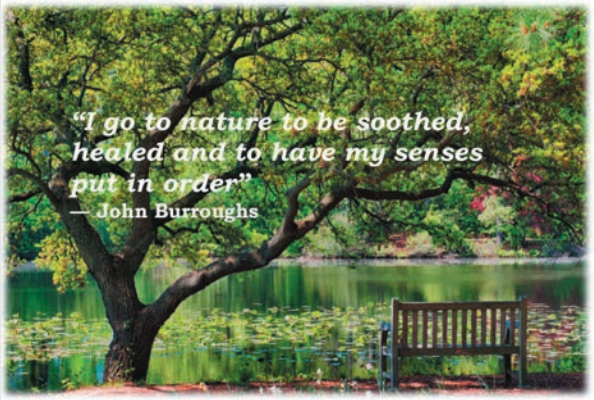
PrideFest 2019

Member Swap

(Left) FuseFest attendees decorated pots of plants given away at the event on July 27th.

(Middle) NBG President & CEO Michael Desplaines and NBG Youth Educator Beverly Albright staffed the NBG table at PrideFest 2019.

(Right) 8,020 visitors with Zoo memberships enjoyed visiting the Garden during the membership swap in June, with 152 becoming members of the Garden.



The tragic shooting that took place at the Virginia Beach Municipal Center on May 31, 2019, greatly impacted our community. As a place of peace and serenity, the Garden offered a week of complimentary admission to anyone from 5:00 PM to 7: 00 PM. Making the Garden available as a sanctuary was well received and offered a much-needed resource to the community in a time of need.

Kara B. —*"Thank you for this beautiful respite! Enjoyed a lovely walk this evening....just what my soul needed"*

Errign S. —*"What a kind gesture. Nature is so good for the soul and I love to see NBG supporting the community!"*

Insect Survey

Norfolk Botanical Garden was selected again this year to participate in an Insect Survey set up by the American Public Gardens Association (APGA). The APGA surveys sites all across the country to look for invasive pests that destroy native flora. Our campus is valuable due to our proximate location to the many ports of Hampton Roads and the Norfolk International Airport--all of which are prime vectors for pests to travel across the globe from their native habitat to ours.

We have chosen several locations throughout NBG to trap the target pests. These selected survey sites use passive traps that contain specific pheromones to lure target species into them, if in fact they are present at NBG. We conducted eight survey sites last year, six of which were physical traps while the last two were visual surveys looking for pest damage on their host species. Four of these traps were Lindgren Funnel traps as depicted in the photo.

Once the traps are in place, the sites must be checked and the traps emptied of specimens every two weeks. The lures must also be changed periodically. The collected specimens are then shipped to the Virginia Tech Extension office for identification.

The target species we are trapping include two Pine Engravers – *Ips sexadentatus* and *Ips typographus,* the Japanese Pine Sawyer – *Monochamus alternatus*, Oak borers and the Oak Ambrosia Beetle – *Platyupus quercivorus,* and the notorious Emerald Ash borer – *Agrilus plannipennis*.

So far the results of this survey have been negative for all target species with one exception - the Gypsy moth (we found many of them). Because of our location and diversity of plants, we expect to participate in future surveys.

Horticulturist Colton Tomsic checks a Lindgren Funnel trap for target pests.

Green Scene

NEW! Beehives and Compost

Have you checked out our new beehives and compost demonstration area yet? The honey bees have settled into their new home and are thriving! Right next to the hives is our compost demonstration area with six different types of backyard composters on display. Both areas have wonderful interpretive signage to provide a better understanding of these sustainable practices and pique your interest in doing so at home.

Glyphosate Reduction Program

As part of our effort to reduce the use of the herbicide glyphosate, the Horticulture staff are conducting a study from June 2019-November 2019 to compare the relative effectiveness in weed control of glyphosate versus several alternative herbicides. Herbicide brands and their respective active ingredients (indicated in parentheses) included in this study are: Prosecutor (Glyphosate), Scythe (Pelargonic Acid), Avenger (d-limonene), and Finale (Glufosinate-ammonium). These various herbicides will be tested both in side-by-side comparisons in beds that have been specially designed for this purpose as well as in existing beds located in the Rose Garden and the Prickly Pear Lair Garden respectively.

Glyphosate is the active ingredient in the widely-used weed killer Round-up. There is mounting scientific evidence that the use of this chemical is contributing to the global health decline of multiple species of bees and is negatively impacting human health. Conclusions from this study will be featured in the next edition of *Dig*.

Solar Panels Update

We love sunny days! Not because it makes our plants grow but because our solar panels are generating energy. Since their installation in August 2018, they have generated over 50 MWh (megawatt hours) which has supplied a majority of the greenhouse's energy needs. We've also saved more than $5,000 in energy costs since the panels went live last August. This past April and May, our electric bill for the Greenhouse was actually zero! The only cost accrued was for the meter - $6.95.

Beyond cost savings, we're also making a difference in carbon dioxide output. To date, we have saved 26 tons of carbon-producing energy sources from contributing carbon dioxide to the atmosphere. This is the equivalent of the carbon sequestering power of 658 trees. If you're ever curious as to how the solar panels are performing the day of your visit, check out the dashboard in Baker Hall Visitor Center. It's on the wall to the left of the Information Desk.

Green Power

In addition to solar power, the Garden is 100% invested in the Dominion Energy Green Power program. This allows us to match 100% of our monthly electricity usage with Renewable Energy Certificates. With these certificates, Dominion Energy replaces energy generated from non-renewable sources on their power grid with energy generated from reneweable sources. Pursuing this option is a worthy investment because it provides the opportunity to offset our carbon footprint and support green energy. For more information on the program, check out: www.dominionenergy.com

Research:

The systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.

OLD DOMINION UNIVERSITY

Bog Candles

In this research project funded by the ODU Honor's College, Dr. Lisa Wallace, J. Robert Stiffler Chair of Botany at ODU and Director of Science for NBG, and Vanessa Stone, an undergraduate researcher, are investigating seed germination requirements of a temperate orchid known as bog candles or scentbottle (*Platanthera dilatata*), so named for its fragrance and appearance as a tall white candle standing amongst vegetation. Although this species does not occur naturally in Virginia, close relatives in the genus *Platanthera*, as well as other native orchids, can be found in Virginia and at NBG.

In the research being conducted at NBG they are trying to trap symbiotic fungi (*mycorrhizae*) from the soil using seeds. In the wild, orchids rely on mycorrhizae for seed germination and nutrient uptake throughout their lives. Because of the diversity of soil types and plants capable of growing at NBG, they suspect that there could be compatible mycorrhizae for this species. By trying to germinate seeds outside of areas where they were harvested, the researchers can better understand just how specific relationships between orchids and mycorrhizae are.

The scientists are also conducting related experiments at the ODU Kaplan Orchid Conservatory to test seed germination on nutrient media without mycorrhizae. Ultimately, they hope to figure out how to propagate bog candles outside of their natural habitats in order to more easily study the species' biology. In the future, they may also be able to introduce a new species to display at NBG for all of the community to enjoy.

Old Dominion University professor Dr. Lisa Wallace researches seed germination of orchids.

Norfolk Botanical Garden works with other educational organizations to study & protect the environment, take action, and make needed changes while conserving bio-diversity.

WILLIAM & MARY
CHARTERED 1693

Bittersweet:

Can toxic chemicals in nectar affect pollinators?

Milkweed is well known as the only host plant for monarch butterflies. Unlike nearly all other insects, monarchs can eat milkweed because they can tolerate the toxic chemicals, known as cardenolides, produced throughout the plant. Dr. Harmony Dalgleish, assistant professor of Biology with the College of William and Mary, is interested in the effect cardenolides found in the nectar of milkweed have on visiting pollinators. Since different species of milkweeds produce different amounts of toxins, Dr. Dalgleish's students collected nectar samples from four different species of milkweed growing at the Garden: *Asclepias curassavica*, tropical milkweed; *A. syriaca*, common milkweed; *A. incarnata*, swamp milkweed; and *A. tuberosa*, butterfly weed.

Nectar is a complex combination of three different sugars: sucrose, glucose and fructose. Plants make sucrose, but it is the microbes in the nectar that convert sucrose into glucose and fructose. The researchers' hypothesis is that higher amounts of cardenolides will prevent microbes from living in the nectar and thus lead to nectar that is mostly sucrose. This is important because different pollinators prefer either nectar that is mostly sucrose (such as honey bees) or nectar with more fructose and glucose (beetles, for example), and could impact the amount or success of pollination and seed production.

William & Mary students Margaret Donnan and Dean Robinson in the Bristow Butterfly Garden at NBG.

Dean Robinson scans milkweed leaves using a spectroradiometer. This instrument shines light through the leaves and measures how much of the different wavelengths are absorbed. This information can be used to predict leaf chemistry, such as the amount of nitrogen and cardenolides, the toxic compound that milkweed makes and contains.

Serendipity:

The occurrence and development of events by chance in a happy or beneficial way.

The Garden experienced its own brand of serendipity in August of 2018 when it connected with retired Navy Chief Petty Officer, Ray Neubauer. Ray's experience as an aviation and structural mechanic with the Navy has indeed proven beneficial for the Garden, especially regarding the annual Dominion Energy Garden of Lights.

Ray has found a role at NBG doing something he truly enjoys, working with electrical and structural projects. "The staff always makes me feel welcome, appreciated, and they are very receptive to my input," Ray said. His talents even spill over into works of art as evidenced by the stained glass window he made for the light crew that now hangs in their workspace.

At more than 1.2 million lightbulbs in the show, there are bound to be new hurdles to overcome to make everything run smoothly. One of the staff members that Ray often works with, Nicole Marlowe, says that Ray has a knack for troubleshooting. "His knowledge, work ethic, and attention to detail are not only paramount to the quality of the show (and clearly evident in the pieces he has helped to refurbish), but they are also the key traits that have made him an integral member of the light crew," she said.

Mostly due to his devotion serving on the holiday light crew team, Ray logged nearly 850 hours in the 11-plus months he was here in 2018, surpassing all other volunteers in hours for the entire year.

Tribute Opportunities

The beauty, wonder and serenity of the Garden combine to create a perfect setting to honor a loved one, pay tribute to a friend, or mark a special anniversary or milestone. Select from a number of sites in the Garden to place our teakwood bench, complete with commemorative plaque. Please call Cathy Fitzgerald at 757-441-5830 ext. 319 or email her at cathy.fitzgerald@nbgs.org to make an appointment or discuss all tribute opportunities.

Evergreen Society Members

The Evergreen Society recognizes and celebrates an outstanding group of friends who generously support the Garden beyond their lifetimes. If you are interested in learning more about the Evergreen Society, methods for making a planned gift, or alerting the Garden to a gift in your estate plan, please contact us.

Annette Averitt, I.M. & Sarah Lee Baker, Ty & Martha Brown, Elizabeth Bruce, Blanche C. Chappell, Robert & Janie Creecy, Cindy Cutler & Craig Haines, Sandra L. Dashney, William W. Eley, Richard & Eleanor Evans, Cathy Fitzgerald, Joe Foreman, Jane Frazier, Robert M. Gostel, Randy Harrison, June Hoye, Kit E. Johnson, Karen S. Gershman, Edward C. & Betty Lou Johnston, Sr., Patricia A. Kiefer, Patty L. Landrum, Eleanor Marshall, Bee McLeod & Goody Tyler, Rick Morsink, Nancy Nelson, Edward & Gayle Nichols, Susan L. Oldridge, Brian O'Neil, Dana Parker, Stephanie Pope, Mildred Amsinger Powers, Judy Pravecek, Ann Rathbone, Pamela Read, Alan Rohanna, Kurt & Debbie Schroeder, Sam Strickland, George & Nancy Sutcliffe, Sylvia E. Simons Trembelas, Jim & Christian Valone, Richard & Ann Weber, Pearl Windle, 3 anonymous.

Be part of the Garden's Evergreen Society and help ensure a vibrant future for the Garden.

Leaving a Legacy

Give the Gift of Nature

It's a gift that lasts all year - a Norfolk Botanical Garden Membership!

A Norfolk Botanical Garden Membership is the gift that comes in hundreds of sizes, shapes, smells and colors. Who wouldn't love a present that offers 175 gorgeous acres, with more than 60 themed gardens to be viewed by tram, boat, bike or foot?

NBG Garden membership is a year-round ticket to experience free admission to beauty during all four seasons. Membership also includes multiple discounts, special event invitations and reduced or FREE admission to more than 300 U.S. botanical gardens. So go natural this holiday season, and give the gift that keeps on blooming. To order a gift membership, visit: norfolkbotanicalgarden.org/support/ or call 441-5830, ext. 324.

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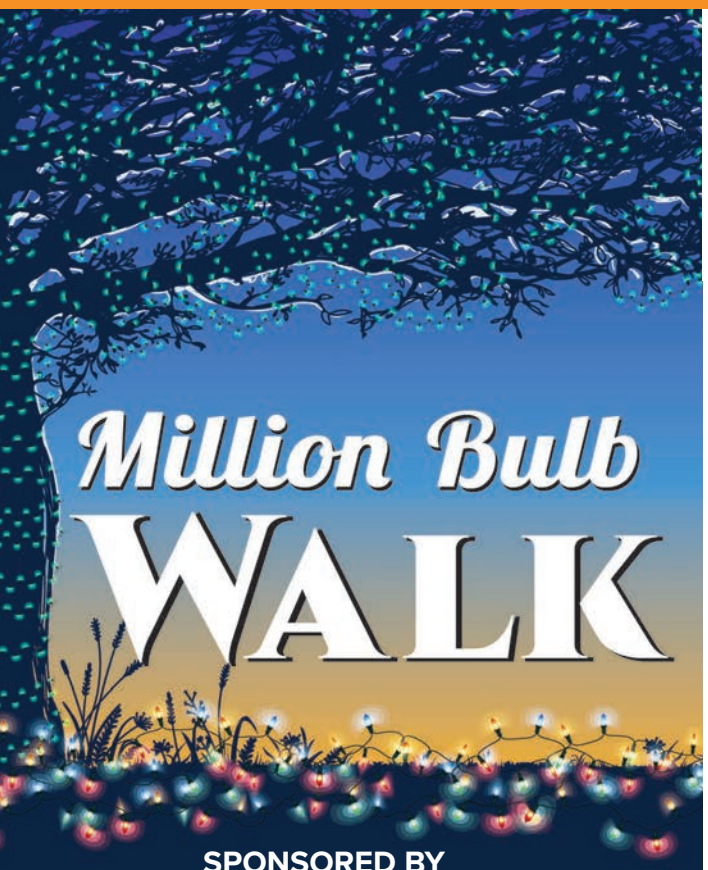

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November 8 — December 14
4 PM — 9 PM
Tickets On Sale OCT. 1st
NBGholidays.org

NATURE CONNECTS®
ART WITH LEGO® BRICKS

If you love LEGO bricks,
you'll love Nature Connects,
Sean Kenny's exhibit of giant sculptures!

Opening
January 17, 2020

Included with Garden Admission!