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FROM THE EXECUTIVE DIRECTOR

DEAR FRIENDS OF THE NATIONAL ARBORETUM:

Anniversaries are a time for reflection and celebration. They’re also a time to look to and plan for the future. At Friends of the National Arboretum, we have two exciting anniversaries coming up. As a friend and supporter, we want you to be in the know, and we want you to be part of the celebration!

First – This year we celebrate the 50th anniversary of FONA’s Washington Youth Garden (WYG).

In 1971, a group from the DC Department of Parks formed WYG to teach children horticultural skills and environmental awareness, as well as life skills such as team building, leadership, and personal responsibility. FONA “adopted” WYG in 1996 and started a partnership with DC Public Schools to deliver expanded education programs. Over the next year, we’ll celebrate 50 years of educating youth and teachers, plus all the people who have been a part of our garden efforts over the years. We’re committed to ensuring the WYG continues to be an important resource for our community for another 50 years. In particular, we’ve begun renovating the one-acre garden located near the Capitol Columns at the Arboretum. The plans include a revised garden design, play areas, signage and interpretive materials, fencing, and more. These and other exciting changes are on the way to enhance our educational capabilities and our ability to grow food in the garden for the community.

Second – in 2027, we will celebrate the centennial anniversary of the U.S. National Arboretum.

The Arboretum was established by an act of Congress in 1927, thanks to the efforts of David Fairchild and many determined garden club women who were committed to establishing our “nation’s arboretum.” The Arboretum’s core purpose remains the same after all these years: it is focused on horticultural research for the benefit of everyone in our country. As a public garden in northeast Washington, the Arboretum also provides critical urban green space for people to explore, learn, and unwind, and to connect with nature and science. Altogether, the Arboretum is more important now than ever.

As a friend and supporter, you are an important member of our community. We look forward to celebrating with you and including you in our plans. The future is bright and exciting! Stay tuned, and please drop me a line if you have any questions. I’d love to hear from you!

Craven Rand, Executive Director
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ON THE COVER Flowering trees in the Dogwood Collection feed a visiting swallowtail butterfly.
As of this writing, the spring flush has already begun to harden off, and plants are distancing themselves from winter dormancy. Sunshine warms the soil, allowing roots to resume growth and mobilize stored reserves to support this spring flourish. As gardeners, we eagerly track the awakening and progression of swelling buds, flowers, and foliage. We also aid or protect the process by peeling back protective mulch so as not to smother new growth if we have unmasked too soon.

Now more than ever, the U.S. National Arboretum is serving as a green oasis for visitors from Washington, DC, and beyond. In spite of the pandemic, we are seeing unprecedented visitor levels. In fact, in the first three months of 2021, we had more than 300,000 visitors—half our annual total—and at least two weekends with 30,000 visitors each. This growing popularity presents challenges for sure. But it also provides an opportunity to educate and inform our benefactors about the need for additional support to increase visitor services and amenities, provide better access to the Arboretum grounds, and proceed with essential maintenance and repairs.

As our Centennial draws near, it’s important for all who have been part of the development of the National Arboretum to ask “Are we where we want to be after 100 years?” We have six years to delve into that question and celebrate our successes while charting a path toward full realization of the National Arboretum as envisioned by our founders.

I continue to be amazed that I am part of that process and to know that we have a great group of friends and foundations invested in our success. With all of you on board, the future is as bright as our spring days.

Richard T. Olsen, Director
United States National Arboretum

We have seen unprecedented visitor levels during the pandemic. In fact, in the first three months of 2021, we had more than 300,000 visitors—half our annual total—and at least two weekends with 30,000 visitors each.
Cornus florida 'Cherokee Brave' has vibrant pink in its bracts. Although the large pink parts of the blossom look like petals, they are technically bracts or specialized leaves. The actual flowers are very small, yellow, and clustered together in the center.
Spring arrives in the Washington region bringing clouds of blossoms to fill the landscape, from the Mall and the Tidal Basin, through the city’s neighborhoods and the woodlands beyond. In the U.S. National Arboretum’s Dogwood Collection, the unfolding of the seasonal display begins in March when the cornelian-cherry dogwoods (Cornus mas) start to flower. The yellow blossoms are followed by those of the white and pink native dogwoods (C. florida) in mid-spring, with the Chinese dogwoods (C. kousa) blooming as late as June.

Located on a ridge overlooking the Anacostia River, the Dogwood Collection was begun as a tribute to the founder and first president of the Women’s National Farm and Garden Association (WNF&GA), an organization founded in 1914 to help women acquire an education and to promote opportunities for them in the fields of gardening, agriculture, and horticulture. A proposal to develop a dogwood collection at the National Arboretum was put forth at the annual meeting of the group in 1948, and four years later, in May 1952, the Mrs. Francis King Dogwood Garden was dedicated. The garden provides a showcase for the diversity of the Cornus (dogwood) family and related species. It also gives home gardeners a chance to see the plants in a garden setting in combinations they might consider for their own yards.

A native of the eastern deciduous forest, C. florida is the dogwood most commonly found in neighborhood gardens. It’s also a mainstay of the Dogwood Collection, where it grows with other Cornus taxa, many of which are the original trees that were planted sixty-nine years ago.

To get the best new dogwood cultivars available for the Collection, the garden staff works with breeders whose efforts have produced advances in beauty, disease resistance, color, and growth habit. Other plants in the garden have been selected from wild collected dogwoods and their offspring that also have improved garden performance qualities.

Flowering dogwood (Cornus florida) is the state tree of Virginia and Missouri.
One of the unusual varieties of dogwoods in the Collection is *C. florida* var. *urbiniana*, a subspecies of our native flowering dogwood. Known as the Mexican dogwood, it is native to northern Mexico, where it grows at the southernmost range of *C. florida*. Its fused bracts do not fully open, so the flowers resemble Chinese lanterns. Also worthy of attention are the *C. florida* selection developed by the University of Tennessee breeding program. All of these trees have the word Appalachian in their names such as ‘Jean’s Appalachian Snow’, ‘Kay’s Appalachian Mist’, and ‘Appalachian Joy’. They have been bred to resist powdery mildew, a foliar disease that has had a serious impact on the native dogwoods.

While the U.S. Department of Agriculture (USDA) is not actively breeding dogwoods, it has aided researchers and plant breeders in the trade and at universities by making germplasm available to interested parties and awarding grants to help fund their research. Through the National Institute of Food and Agriculture, Rutgers University has received USDA funds for the last several years to help with their breeding programs to improve dogwoods, filberts, and hollies. A recent example of great breeding work is the excellent new *C. kousa* variety ‘Scarlet Fire’, developed collaboratively by Rutgers University and a USDA-Agricultural Research Service (USDA-ARS) research geneticist, Dr. Phillip Wadl. This hybrid, like others derived from crosses between native dogwoods and Asian dogwoods, blooms after *C. florida* and before *C. kousa*, filling the gap in flowering times and maintaining a continuous display of flowers.

Arboretum staff who work with the Dogwood Collection contend with some of the same challenges faced by many gardeners, especially invasive plants and deer. Controlling ivy and keeping other weedy plants such as Ampelopsis, Virginia creeper, and ground ivy from taking over requires a good deal of time and effort.
GEORGE WATERS had always enjoyed gardening when, in the early 1970s, a friend introduced him to the Arboretum by suggesting he check out “this cool garden of little trees.” Since he lived nearby, he began spending a lot of time exploring and getting to know the gardens, including that “cool garden,” which turned out to be the Gotelli Collection of Dwarf Conifers.

Throughout his career, George has had a variety of jobs: janitor at NASA in Greenbelt during high school and cook and baker at a few different restaurants in DC. For twenty years, he worked in construction and also did some gardening and farming. He says that he has his friend to thank for setting him on a path to becoming a horticulturist.

During the 26 years that George has been employed at the Arboretum, he has gone from working as a FONA intern and gardener in the Azalea Collection, moving on to the National Herb Garden, and then spending about six years as a horticulturist in the Asian Collection. His official title is Agricultural Science Research Technician (ASRT), and for the past fifteen years, he has worked in both the Gotelli and the Dogwood Collections.

He takes great satisfaction in having the opportunity to maintain and improve these historical gardens. “One thing that always gets me,” says George, “is when visitors come up and tell you how much they enjoy the gardens and appreciate your work.”

And when he’s not at work? He likes cooking, especially with ingredients from his own garden, and listening to the music of the Caribbean and New Orleans.
MARCH 2021: WHILE THE CHERRY TREES AND OTHER PLANTS are blooming in March, the plants at the Washington Youth Garden (WYG) are just now waking up. A lot of the new developments at the garden have been in the works since last March.

Last summer, we began implementing a no-till system, and we are starting to see the results of it this spring. Instead of turning the soil in order to seed, we are mulching with compost and planting directly in the soil. The WYG has been cultivating plants for nearly 50 years, so this new regenerative agricultural approach helps to protect the biome of the soil. Left undisturbed, the seedlings are able to access all of the microorganisms in the soil that can help them grow. This approach also allows more carbon dioxide to be captured in the soil to help combat climate change. And the best part—it has been less work for our small team.

Last March, the apple and peach trees from the WYG orchard area had to be removed because of pest problems and lack of fruitful production. Following that decision, a new orchard of 18 fruit trees and shrubs was planted with help from our partner, Fruit Tree Planting Foundation. These new trees are pest resistant, and many of them are native to the Northeastern region. The new orchard includes American plums, chokeberries, serviceberries, and paw-paws. We also

We’re making changes to the Washington Youth Garden as we celebrate our 50th anniversary!

Above: Thanks to donors who participated in the December matching gift fundraiser with Seed Money, we have started to build new raised beds. There’s still one more step to complete the seating elements. Right: This March photo still has the winter cover crops, part of our no-till growing practices. We aim to repeat last year’s production of 4,000 lbs. of produce grown and donated to local families.
moved the beehives so they get more sun and have incorporated them into the new orchard design. This has helped them to survive the winter, and we look forward to watching the bees busily pollinating our garden again this growing season.

Thanks to donors who participated in the December matching gift fundraiser with Seed Money, we have built new raised beds. They are strategically placed in an area where the in-ground beds were suffering last season because the drainage was poor. The U-shape design is for educational purposes and will allow teachers and students better access to portions of the garden so they can more easily gather and discuss what they are seeing. There will also be built-in seating so visitors can relax and experience the garden. And we couldn’t have built that seating alone. We were happy to have help from three young gardeners, all former Green Ambassadors, who will officially begin as part-time interns in April.

Finally, we have started the process of renovating and redesigning the garden space for the WYG’s 50th anniversary! This will include landscaping and signage updates to make the garden more inviting to the community. Groundsmith Collective, our landscape design consultants, have begun conversations with staff and will provide us with several plans to present to stakeholders, visitors, teachers, families, and volunteers. It is our hope that with your feedback on these redesign ideas, the demonstration garden will receive a fun, playful boost to celebrate its 50th anniversary.

WASHINGTON YOUTH GARDEN IS CELEBRATING 50 YEARS OF GROWING GREEN DREAMS!

Thanks to the support of friends like you, we’re reimagining our garden to better engage visitors and immerse them in self-guided activities, adapting our programs to better support schools’ needs, and strengthening our youth development program. There are more invitations and news to come about this exciting anniversary!
WHAT’S THE “BBIG” DEAL WITH BOXWOOD BLIGHT?

Scientists at the U.S. National Arboretum are part of the Boxwood Blight Insight Group (BBIG) working to beat boxwood blight, a disease that wreaks significant damage on gardens and the American nursery industry. Dr. Fred Gouker describes the work his team is doing with new research funding through the U.S. Department of Agriculture (USDA).

Leaf assays in the lab show a range of susceptibility and tolerance across boxwood varieties and hybrids. Photo credit: Fred Gouker, USNA.
WHAT IS BOXWOOD BLIGHT?

Boxwood blight is an emerging disease caused by two fungal species that has been inflicting significant damage in the ornamental horticulture industry, in the landscape, and in the natural ecosystem. The fungi that cause boxwood blight (Calonectria pseudonaviculata and C. henricotiae) can infect during all growth stages and can attack all above-ground portions of the plant (leaves and stems). Infection begins as dark leaf spots (lesions) that can develop brown centers and dark brown to black lesions on the stems. Infected leaves are shed from the shrub, and generally, the new growth is infected last. Once symptoms develop, boxwood blight can cause rapid defoliation and death of the entire plant. The resting stage of the fungus can persist in the soil for a year or more on dead boxwood leaves that fall off the plant.

HOW IS IT SPREAD?

The life cycle and mode of transmission contributes to the rapid spread of boxwood blight. The fungus can overwinter on infected plants and in leaf litter. The fungal spores from infected leaves and stems can be splash-dispersed through irrigation, rainfall, wind, plant debris, and contaminated tools and equipment (such as pruners or boots) during the growing season to cause new infections. Warm, humid, and shady conditions favor disease development. The disease can also be spread great distances, primarily by moving contaminated plants and cuttings through the nursery trade and using contaminated tools.

HOW LONG HAS IT BEEN A SERIOUS CONCERN?

The first documented case of boxwood blight occurred during the 1990s in the United Kingdom and New Zealand but then rapidly moved throughout Europe and Asia. Boxwood blight was first detected in North America in 2011 in Connecticut and North Carolina and has since spread throughout the United States and Canada.

HOW CAN AN INFECTED PLANT BE IDENTIFIED?

Once a plant is infected, it can develop symptoms within days, which is why early detection is critical. Scouting and early diagnosis of infected plants is the best approach for avoiding rapid spread. Diagnosis can be difficult, but boxwood blight stands alone in its ability to defoliate; no other boxwood disease does this. If homeowners find symptoms of blight on their plants,
**BBIG TEAM STAFF HIGHLIGHTS**

**SUSAN BENTZ** began collecting boxwood species and cultivars around 2013 with Dr. Richard Olsen and continues to do so with Dr. Fred Gouker. Based at the South Farm location in Beltsville, MD, she is installing and maintaining the team’s hybrid boxwood evaluation plot. “The utility, beauty, and variety of shapes, sizes, and greenness of *Buxus* species” makes boxwood worth preserving. The variety of tools and ideas that the team is using to study boxwood blight make this an exciting project. Knowing that many more *Buxus* species are found only in Cuba, she wonders what, if any, resistance they have to boxwood blight.

**FRED GOUKER** is a Plant Geneticist/Breeder in the Arboretum’s Floral and Nursery Plants Research Unit in Beltsville, MD. His research program focuses on development of improved woody ornamental landscape plants with superior ornamental value that are tolerant to abiotic and biotic stress. A Project Co-Director for the BBIG project, Fred is leading efforts for boxwood blight resistance breeding and genetics research and extension activities.

**HENRY GUO** has been at the Arboretum for 8 years as a microbiologist. He is developing assay methods for screening boxwood resistance to blight in new and existing cultivars. He’s excited to report that he has established a simple detached-leaf assay for rapid screening of the plant’s resistance or tolerance to boxwood blight.

**SHARON JHINGORY-AHMAD** returned to the Arboretum in October 2020. For the boxwood project, Sharon performs “Boxwood Blight Detached Leaf Assays to select for resistant genotypes and cultivars. We challenge various cultivars with the fungus that causes boxwood blight (*Calonectria pseudonaviculata*) and check for susceptibility by measuring lesion size.” She finds it “interesting that boxwood is so readily used, but people have no idea about the devastating effects of boxwood blight. This disease can wipe out a whole field of boxwood. It is great that we are doing research on such an important and beautiful green shrub widely used in landscapes.”

**TWO POST-DOCTORAL RESEARCHERS** are being hired to work specifically on boxwood research—one project is related to blight detection using image analysis and another project is focused on breeding and genetics.
they can submit samples to the local extension office or the local university plant diagnostic laboratory for testing.

There are fungicide treatments that can help prevent further deterioration of the plant or spread to nearby plants once the plant is infected, but treatments will not completely eradicate the pathogen. Since the resting state of the fungus can stay in the soil for a very long period of time, it is unwise to replant with a susceptible variety of boxwood. If heavy infection occurs, those plants should be destroyed to prevent further spread; very carefully remove all traces of the leaves and infected stems, discarding them in the trash rather than composting them. Other methods to help prevent disease development and spread are using clean tools and equipment, such as cleaning pruners and boots with 70% alcohol. Proper use of irrigation methods such as drip irrigation will prevent splashing and potential disease spread. Mulching around plants to prevent splashing and disease development is another method to help prevent spread of the disease. However, the best long-term sustainable solutions will come from developing resistant cultivars through breeding.

Specifically, our project is aimed at developing a better understanding of boxwood blight in nurseries to help growers keep the pathogen out or get rid of it. We are developing several major innovations such as diagnostic kits, more resistant cultivars, boxwood self-defense enhancers, physical barriers, and biological controls. We are also investigating boxwood genetics so we can develop resistant cultivars and integrate best management practices to provide optimal economic value to the industry.

The Arboretum’s primary role in this project is to develop new resistant cultivars through traditional breeding and advanced genetic and genomic technologies. We are ultimately looking to take our research results and translate them into products and practical recommendations for sustainable boxwood production for landscaping and gardens. Hopefully, this will enable growers to produce, sell, and ship only blight-free plants, making them more competitive in domestic and global markets. It will also empower landscapers and gardeners to better protect existing plantings and more effectively manage the disease.

**WHAT EFFECT IS BOXWOOD BLIGHT HAVING IN THE UNITED STATES THAT MAKES IT A SIGNIFICANT PROBLEM?**

Since boxwood plants have a significant economic value, boxwood blight is threatening an industry with a total annual value at more than $140 million USD, based on the most recent report (2019) from the USDA National Agricultural Statistics Service Census of Agriculture. Most recently, the blight caused more than $500,000 worth of crop loss in a single garden in Tennessee. However, even with the presence of boxwood blight, the value of boxwood sales has continued to increase over the past 10 years, which indicates that boxwood remains a popular choice among gardening and landscaping consumers. However, if the disease continues to spread, consumers will turn to alternatives, which we are already starting to see.

**USNA RESEARCH PROJECT**

**WHAT ARE THE DETAILS OF THE ARBORETUM’S RESEARCH GRANT?**

Our research grant, funded by the USDA National Institute of Food and Agriculture–Specialty Crop Research Initiative (SCRI), is for a project aimed at safeguarding boxwood (the nation’s largest evergreen shrub crop and iconic landscape plant) from boxwood blight through plant breeding and genetics, innovation, economic analyses, and education. Our research team is aptly named the Boxwood Blight Insight Group (BBIG), and it partners with representatives of the horticulture industry and international collaborators.

The research for this project takes place at the Arboretum in Washington, DC, and in the laboratories, greenhouses, polyhouses, and field nursery in Beltsville, MD, so we are using every possible resource for this project. The Boxwood Collection is especially important for this research project because it is a source of plant material that we are actively evaluating. There is untapped potential for boxwood blight disease resistance in the Collection that has yet to be discovered. A lot of the plants in the Boxwood Collection are being used in the boxwood breeding program to develop and test hybrids for disease resistance. The Arboretum has one of the largest collections of boxwood in the entire country, and it is a critical asset to our research. In addition, the research we are conducting is helping protect and preserve the Collection itself from potential blight infection, which is always a concern. 🌿
Jazz Up Your Garden With Tropical Plants

Did you know that the mid-Atlantic region has perfect summer heat and humidity for supporting a vast array of tropical plants that will grow exceedingly fast in a single growing season? The diversity of large and brightly colored foliage paired with exotic flowers will give your garden an otherworldly ambiance. Tropical plants provide special foliage, exotic flowers, and vertical interest with vines. The amazingly broad selection of tropical plants that have come to market in the past ten years is exciting, even for experienced gardeners.

IDENTIFY

- Areas of your garden that were lackluster last season with minimal textural variations. The addition of a bold-leaved tropical plant may be the answer.
- Empty areas where a plant loss has left a gap.
- A prominent view or an important entry point. A tropical annual display with attitude will intrigue your visitors.
- Special wildlife that you would like to invite into your garden: hummingbirds, butterflies, hummingbird moths, and sphinx moths.
- A young gardener eager to have plants of their own to tend while experiencing the lessons of nature.

PLANT

As with any plant, dig a hole at least twice as wide as the root ball. Plants should be placed at the same level as they were growing in their container, no deeper. Loosen roots to improve water penetration to the root mass. Pack soil around the root mass so a slight tug will not unearth the plant. Incorporate slow-release fertilizer into the hole or container at planting time. Water thoroughly after planting.

CARE

Until they are rooted in, keep your tropical plants from drying out. Remove spent flowers regularly, and clean off yellowing leaves. Fertilize every two weeks with a liquid fish emulsion.

Get going right now and plant your head-turning jungle. The character of your garden and containers will make your "staycation" of 2021 exotic, just like the tropics! 🌿
The Friends of the National Arboretum is an independent, nonprofit organization established to enhance, through public and private sector resources, support for the U.S. National Arboretum.

HAPPENINGS
For more information, visit usna.usda.gov or fona.org

GET UPDATES BY EMAIL AND ONLINE
Sign up for the FONA Field Notes email newsletters at FONA.org to get regular updates from the Washington Youth Garden, behind-the-scenes stories, photos of the Arboretum’s currently flowering plants, and invitations to our “Digging In” virtual series of expert presentations and live Q&A.

GARDEN FAIR
The annual FONA Garden Fair & Plant Sale will not be held this year, but mark your calendars for a Bulb and Succulents Sale in late September.

EVENTS
The calendar of events is updated regularly at FONA.org. Meditative forest bathing sessions are offered several times a month. Register online.

STREAMING NOW
Watch the Arboretum bald eagles through the Eagle Cam. See streaming video of the nesting pair at naeaglecam.org
Watch FONA’s Digging In presentation from March about this year’s drama at the nest of the Arboretum’s eagles.