Center for Urban Agriculture and Gardening Education
College of Agriculture, Urban Sustainability and Environmental Sciences
University of the District of Columbia

The College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) of the University of the District of Columbia offers research-based academic and community outreach programs that improve the quality of life and economic opportunity of people and communities in the District of Columbia the nation and the world.

The College of Agriculture, Urban Sustainability and Environmental Sciences at the University of the District of Columbia (CAUSES) is on a mission to make the residents of D.C. healthier and more food secure. Food security refers to having access to a steady, dependable supply of nutritious food that supports a healthy and active lifestyle. The Greater Washington Metropolitan area is one of the wealthiest in the world, yet there are people in our communities who have no access to fresh, nutritious food. This population is food insecure.

The University of the District of Columbia is a landgrant institution, receiving its designation in 1967. As the nation's only urban landgrant, UDC must marry the traditional landgrant mission with an urban environment. In addition to offering academic programs in architecture and community development, urban sustainability, health education, nursing, and nutrition and dietetics, we also offer a wide range of community education programs through our landgrant centers: (1) the Center for Urban Agriculture and Gardening Education, (2) the Center for Sustainable Development which includes the Water Resources Management Institute, (3) the Center for Nutrition Diet and Health which includes the Institute of Gerontology, (4) the Center for 4-H & Youth Development and (5) the Architectural Research Institute.

The Center for Urban Agriculture and the other Centers have several community programs helping to fight food insecurity in the District. CAUSES Dean Dr. Sabine O'Hara has launched a number of community partnerships that connect the dots between locally grown food, nutritional health and economic empowerment. Our programs offer D.C. residents the skills to grow their own food, and the research farm seeks to provide expertise to make urban farming a successful business. In collaboration with the CAUSES Center for Sustainable Development and the Center for Nutrition, Diet and Health, the Center for Urban Agriculture plays a large role in improving the nutritional health of District residents, many of whom live in food desert neighborhoods with little access to fresh and healthy food; and therefore experiencing an increased rate of preventable health issues such as obesity, diabetes and hypertension.

UDC Research Farm

Mchezaji "Che" Axum is the Director of the CAUSES Center for Urban Agriculture and Gardening Education. Che is an environmental agronomist with more than 25 years of experience in agriculture. He leads a team of researchers at the UDC farm in Beltsville, Maryland, and oversees the Master Gardening, Specialty and Ethnic Crops, and the Urban Forestry programs.

A native Washingtonian and third generation farmer, Axum is a graduate of the University of Maryland, College of Agronomy, now named the College of Natural Resource Management, and for 20 years, served in several capacities for the USDA Agricultural Research Service, Plant Sciences Institute.

Axum is part of the CAUSES leadership team that develops and implements the vision for the farm, along with Dean and Director of Landgrant Programs Dr. Sabine O'Hara, an agricultural economist, and Associate Dean of Landgrant Programs William Hare, UDC's resident soil scientist. Together, their vision is becoming a reality: making Muirkirk Research Farm one of the most exciting new research facilities UDC has to offer.

Farm Overview

Muirkirk Research Farm is formally named the Agricultural Experimentation Station of the District of Columbia and was established by the USDA to research and test techniques in urban agricultural that are consistent with sustainable practices.

Agriculture and horticulture are usually associated with rural settings and large open spaces. Our farm focuses on adapting successful, highly efficient farming techniques to small urban spaces; whereas our urban agriculture program focuses on techniques to increase productivity in small urban land areas, soil management and remediation, energy and water saving techniques, and high value ethnic and specialty crops.

Our hydroponic systems explore techniques to grow a wide variety of vegetables in nutrient enriched water rather than soil. This growing method can generate exceptionally high yields, and is no longer limited to only microgreens, but can be used for vegetable varieties including tomatoes, peppers, cucumbers and squash.

The farm is managed using sustainable systems and methods that reduce strain on the environment. Our customized aquaponic systems allow us to raise fish and grow vegetables in a self-sustaining closed loop system where fish waste is used as plant fertilizer, while the water is filtered and recycled. This is accomplished by use of the Flo-Vex aeration device, pioneered by CAUSES professor of Environmental Science, Tom Kakovitch.

Recently, we've installed solar panels to power a solar well pump that supplies a 5,000-gallon cistern with groundwater. The cistern forms the centerpiece for our irrigation and fertigation system: irrigating with nutrient rich water from the fish tanks. We are also in the process of building a composting facility that intends to test various composting mixes (food waste, yard waste etc.) and composting techniques.

As for what we grow, at any given time, you can find asparagus, beans, lettuce, collards, eggplant, artichokes, peppers, tomatoes, tarragon, ginger, turmeric, mint, basil, spinach, Swiss chard, squash, limes, strawberries, raspberries, Asian pears, blackberries and apples, to name a few of the rotating crops. The farm also plans to reintroduce the pawpaw, a rare fruit native to the Greater Washington area.

As a public landgrant university, UDC receives funding from D.C. taxpayers and the U.S. Department of Agriculture. As such, priority always is given to local residents in terms of sharing information and finding innovative ways to make use of our high quality produce. We are also in contact with other landgrant universities to share knowledge and experiences.

Farming in the City

As farm manager, Che Axum spends most of his day farming, but he and his small but dedicated team (Alemayehu Waggie, Yao Afantchao and Roy Lycorish) also spend a great deal of time applying experimental techniques and analyzing the results. The information extracted from the experiments finds its way into our teaching, but also informs the management of our own farm.

Many of the research techniques utilized at the farm are innovative, but not necessarily new. Our methods are developed with a specific view to adapting them in an urban setting. Urbanites who visit the farm are often surprised to learn that there is an easy solution to their farming and gardening problems. Using plastic or cloth covers to protect the crops during extreme weather, using trellises to keep crops off the ground, weed suppression and alternating crops (intercropping) to maximize space - these are techniques that can be easily implemented by the average urban gardener. Another simple experiment is growing vegetables in boxes with varying depths of soil. These practical techniques can help urban residents use their small gardening spaces to the fullest extent.

Upon visiting the farm, you may notice fields with rows of raised-bed crops growing out of plastic or cloth. Permeable cloth-covered crops can be watered under the cloth. This saves water and helps reduce weeds; a plus for crops covered with plastic is that they cannot be oversaturated, as the water slides right off the plastic.

"Cover crops" are used as a weed suppression technique and for soil enhancement. Our farm uses a variety of sweet clover that germinates when it is warm. For those who thought clover was a weed, Axum explains: "A weed is a plant growing where you don't want it, but it doesn't have to be a weed."

Clover is in the legume plant family, which absorbs nitrogen from the air through its leaves, and stores the nitrogen in the roots. After the clover is cut and tilled back into the soil, the nitrogen is released. Hence, not only are you getting free organic fertilizer, but the soil is being protected from weeds and aerated at the same time.

Experiments do not always yield positive results. For instance, the 2014 crop of blueberries did not produce a large yield. After analysis, it was determined that soil's nutrient content would need to be addressed. In 2013, a crop of mini broccoli did not produce a single head for harvest. A trial asparagus experiment on the other hand was successful, and we anticipate a prolific crop in the future. By conducting experiments and analyzing the results, the farm team can determine what to plant and how to best grow fruits and vegetables in different locations around the farm.

Tip: Perennials like Egyptian onions, asparagus, Jerusalem artichokes, do not have to be planted each year. They make great vegetables for the novice gardener although they may require some patience.

Solar Water Management

Innovation at the farm goes beyond plants. We are using solar energy to power a process that extracts groundwater for food production. The water is being stored in a cistern reservoir above ground to be used for irrigation purposes and to keep the fish tanks filled. The goal of the solar water management project is to assess if using solar power is a sustainable method of extracting groundwater to irrigate and fertigate crops more efficiently and affordably.

This is of great importance for the future of agricultural production particularly as weather events make our power supply more vulnerable. The technique also makes it possible to use groundwater as opposed to municipal water and will allow us to assess the impact of treated water on food and fish production.

Axum explains: "Solar power allows the farm to operate a more sustainable, closed loop system of agriculture that is conscious of the resources we use, recycling as much as possible."

Small Scale Rice Production

In the spring of 2014, the farm began experimenting with rice production. Rice is the world's number one crop, according to Nazirahk Amen, ND, L.AC, cofounder of Purple Mountain Organics.

But it may be less commonly known that rice production also creates the highest amount of methane; even compared to cattle. Flooded rice patties in particular produce a lot of methane. Although the largest agricultural companies are starting to move away from flooding as a method of rice production, they are still submerging the fields. At Muirkirk Farm, Nazirahk and his team have planted "dryland" rice to test the feasibility of small-scale rice production that is more environmentally friendly.

Currently, small-scale rice production does not exist, meaning the market is essentially monopolized by large-scale agriculture, leaving consumers have little choice in buying rice based on how it is grown. The large-scale agriculture community still depends on genetically modified rice to produce large yields and "Roundup" to kill weeds. This is referred to as "Roundup Ready Rice." Large-scale farms spray the entire field with Roundup, but because the rice is resistant to Roundup, only the weeds are killed.

Our experimental crop uses biodegradable plastic mulch to grow rice. Nazirahk selected two varieties of dry land rice and is using two different depths of irrigation – one inch and six inches. Despite the specialized techniques, he only uses materials and equipment that would be feasible for small farmers. Nazirahk is growing on a small-scale and all the rice is planted by hand.

Another part of the experiment investigates the impact of spacing and tilling on rice yields. Tilling is important because the plants produce different seed heads that can lead to larger rice plants. This experiment requires soil adjustment to take into account regional soil and the ability to grow rice in the grass family.

This project, along with other small scale rice productions in the D.C. metro area will help make rice production a viable option for small farmers. As Nazirahk states: "Our project is really about helping small farmers get back into rice production."

Specialty and Ethnic Crops

In a diverse metropolitan area like Washington, D.C., specialty crops are in high demand. This in part is why CAUSES began entered into ethnic crop production. In making these products accessible and affordable, we are helping to connect consumers to new types of food. We are also giving both native born and or local immigrant populations a taste of home, right here in the Mid-Atlantic.

Our farm uses sustainable growing methods to produce a range of fresh herbs and vegetables that are rare in area supermarkets. Many of them are so-called ethnic crops that do not originate on the American continent, but can be grown locally. As defined by the USDA, specialty crops are fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops that are cultivated or managed and used by people for food, medicinal purposes, and/or aesthetic gratification to be considered specialty crops.

Muirkirk is the home for many herbs and spices from Ethiopia and several species of vegetables from West Africa. Located just north and east of the District, the farm enjoys a humid subtropical climate that allows us to grow these ethnic crops. Ours include but are not limited to:

- Collards
- Hybrid Kale
- Hybrid Pac Choi
- Hybrid Patty Pan Squash
- Hybrid Smooth Leaf Spinach
- Specialty Salad Greens
- Swiss Chard
- Mustard Greens
- Bunching Onions
- Red Russian Kale
- Baby Peppers
- Long Beans

The UDC Ethnic Crops program was established to meet the needs of the rapidly changing ethnic makeup of the region's consumers. In his position as ethnic crop development specialist, Yao Afantchao works closely with local community gardeners and advises residents how to grow and cook a variety of flavorful international menu options. He also introduces commercial growers to expanding ethnic produce marketing opportunities.

According to BBC News, the Washington, D.C. area has the largest population of Ethiopians in the U.S. – about 250,000 people – second only to Addis Ababa, Ethiopia. There is therefore a sizeable market for Ethiopian food products in Greater Washington. Growing Ethiopian herbs and spices on the farm helps us to further expand our reach into this market.

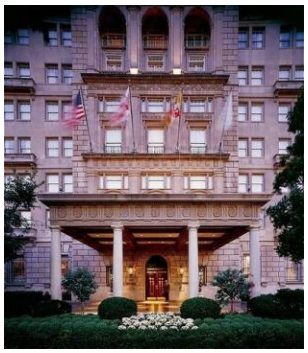
"Ethnic produce presents a significant opportunity for Mid-Atlantic farmers as high-value alternative crops and as an excellent source of income," explains Mr. Afantchao.

Ethnic food products in North America account for more than 12 percent of all retail food sales, and are projected to sustain five percent annual growth. Some of the ethnic crops grown at Muirkirk include:

- Nug (Ethiopian Seed)
- Netch Azmud (Ethiopian Caraway)
- Tikur (Black Cumin)
- Tena Adam (Rue)
- Besobila (Sacred Basil)
- Gboma (African Eggplant)
- Sawa Sawa (edible flower)
- Jamma Jamma (Huckleberry)

Afantchao also partners with the District of Columbia Public School System (DCPS) and DC Central Kitchen to introduce international foods to District youth.

Hay-Adams Partnership



The Hay-Adams Hotel receives a steady supply of locally grown food from the UDC farm. Initially, the farm's purpose was research and demonstration, but expansion and increased production led to marketing produce for revenue generation to build the capacity of the farm. Since 2013, the largest client has been the Hay-Adam's Hotel.

"We wanted to be a part of the CAUSES initiatives to increase local food production and to serve our local community at the same time," says Hans Bruland, Vice President and General Manager of The Hay-Adams, "and this partnership also benefits our clients. There is nothing better than food that was harvested in the morning and is served that same evening; better yet when some of the food reminds you of home – even if home is on the other side of the globe."

"Consumers are becoming increasingly aware of where their food comes from and how it impacts their health and well-being," explains Dr. O'Hara. "The partnership between Hay-Adams and the University of the District of Columbia recognizes that people want to eat locally grown food they can trust."

High Profile Visitors to Muirkirk Farm

In fall 2013, the farm was pleased to welcome the Honorable Winston Thompson, Ambassador of Fiji, and his wife, Mrs. Queenie Thompson. The Fijian Islands--over 300 of them--are located in the Pacific Ocean, east of Australia and north New Zealand. The Thompsons of course took a special interest in our ethnic and native crops program.

"It was very eye-opening for us to see so many familiar food crops

though different cultivars growing in D.C.," commented Ambassador Thompson. For those not trained agrologists like Ambassador Thompson happens to be, a cultivar is defined as a plant variety that has been produced in cultivation by selective breeding.

Throughout the tour given by Associate Dean of Programs William Hare, the Ambassador and his wife sampled many of the ripe crops that were growing--directly off the vine (our farm does not use pesticides or other agents, so active sampling is encouraged). Mrs. Thompson, an avid sampler, delightfully told stories of her homeland, and how she prepared certain crops. She was particularly a fan of the Sawa Sawa or the "sour leaf" plant.

"The passion and enthusiasm CAUSES has for this program is infectious and I'm sure you will have the whole of D.C. converted to growing and relishing these exotic food crops in a short time. Its applicability to our developing countries as they continue to urbanize is clear and we must find a way to expose some of our thought leaders to what is being demonstrated at Muirkirk Farm," stated the Ambassador.

Our farm was honored to also welcome three high profile groups during the summer of 2014: a group of ANC Commissioners; a group from the State Department Foreign Press Center, and a group of African diplomats as part of a Leadership Africa USA visit. The tours were led by CAUSES Dean Sabine O'Hara, Associate Dean William Hare, Farm Manager Che Axum and UDC Professor of Environmental Science, Tom Kakovitch.

DC ANCs

In June 2014, CAUSES hosted its first ANC open house at Muirkirk Research Farm. This was the first official tour for advisory neighborhood commissioners. ANCS, who serve two year terms, consider a wide range of policies and programs affecting their neighborhoods including traffic, parking, recreation, street improvements, liquor licenses, zoning, economic development, police protection, sanitation and trash collection, and the District's annual budget. Dean O'Hara believed that extending the invitation would present a unique opportunity for the ANCs to see and experience the farm's growing operations first hand and the opportunities urban agriculture can offer them and their constituents.

State Department Center for Foreign Press

The farm was pleased to welcome journalists from the U.S. Department of State, Foreign Press Centers on July 21, 2014. The mission of the Foreign Press Centers is to support U.S. policies and priorities by helping resident and visiting foreign media cover the U.S. The visit resulted after Foreign Press Centers' Information Specialist Miriam Rider, read about the farm in the *Washington Post*. "The journalists were really impressed with your operation, and found the tour and the interviews really interesting," Ms. Rider commented. Visiting journalists hailed from Azerbaijan, Estonia, Germany, Romania, Slovak Republic and Voice of America's Chinese News Service.

Leadership Africa USA and USDA Agricultural Research Service

Murkirk Farm was honored to be visited by several African leaders, including the Ambassador from Malawi, as well as diplomats from South Africa and Congo. Leadership Africa USA, established to address challenges facing effective African leaders with a mandate to develop leadership curricula and provide skills training through public-private partnerships for future African leaders, coordinated the tour. The African officials were particularly interested in our aquaponics technology, which is ideal not only for urban areas, but also for those parts of the world with limited arable land. Several USDA-ARS officials also joined the tour.

Challenges and Opportunities

For all of the increased interest and awareness the farm has experienced in expanding its production and research over the past two years, the success has not been without challenges. While the farm can boast of several volunteers, both individuals and groups that assist in its operations it is managed and operated seven days a week by a very small staff.

"At the end of the day when the smoke clears, it's four people who run this place. When I tell people that, they usually respond: You can't be serious," says Axum. "It means that I must select crops we can plant and easily manage--although sometimes that's an oxymoron."

Harvesting the fruits of their labor also proves a challenge, as Axum explains: "When we harvest, everything else stops." In this case,

everything includes such operations as weeding, planting, cultivation of the field and organic pest management.

Current limitations of personnel and transportation capabilities must be addressed to further expand the work of the research farm and to increase its partnerships with local organizations and individuals. For now, while the farm is open to future contracts and partnerships, those interested in partnering with the farm must be able to pick up their own produce.

"We'll harvest and refrigerate, but we don't have the capacity to make regular deliveries," says Axum.

This leaves an opening to close the gaps by increasing partnerships with organizations that do not have the land, but may have the manpower to help meet our common goals of making D.C. a healthy city with healthy residents.

One such partnership is with Bread for the City, who tends to and manages the City Orchard on Muirkirk's land. All of the fruit is donated to feed their constituents—the vulnerable residents of D.C. who rarely have access to fresh fruit. The farm also donates produce to groups that feed underserved populations like DC Central Kitchen. Both organizations bring volunteers and regularly pick-up produce from the farm.

During the Thanksgiving season, CAUSES donated 110 pounds of freshly picked kale and collards to NBC Washington's 'Food 4 Families' campaign. CAUSES donated kale, collards, spinach and other nutritious greens grown at the farm and harvested by several volunteers. Che Axum and William Hare were interviewed by NBC Washington before delivering the vegetables to a local the Boys and Girls Club.

Food donation campaigns usually receive processed and prepackaged goods that go a long way toward helping those in need, but are lacking in nutrition. Kale is loaded with vitamins as well as calcium, iron and antioxidants.

The Farm of the Future

Our farm is in a constant state of expansion. We now have four mobile greenhouses, built on rails to allow a tractor to move them for more efficient planting and harvesting. This allows us to grow crops year round and in the best available location. The hydroponic and aquaponic hoop house continue to produce food and fish, and additional structures are planned for the future.

In the future, an additional solar well pump will be installed to meet increased capacity as the farm grows. And once the composting production starts, the farm will be able to produce its own compost and immediately apply it to the farm fields. Now that's how you 'close the loop' to run a farm in a sustainable manner.

Muirkirk Farm featured in the Washington Post!

UDC's research farm embraces multiple missions: grow, teach and discover (By Tim Carman June 16)

The Washington Post

The farm grows apples, Asian pears and tiny crimson strawberries as sweet as truffles, but few outside the neediest Washingtonians will ever eat the fruit. The farm grows waterleaf, garden eggs and peppers as hot as glowing charcoal, but you won't find the West African and Caribbean produce at farmers markets in the District. And the farm grows greenhouse microgreens, but the fragrant little leaves grace the plates of only one D.C. restaurant.

Muirkirk Research Farm clearly isn't hung up on sales. It has an altogether different mission.

Located in Beltsville, miles from the University of the District of Columbia's Van Ness campus, the 143-acre Muirkirk is part of UDC's relatively new College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES). The college's dean, Sabine O'Hara, decided it was time for the farm itself to grow: Muirkirk needed to expand beyond its community outreach work, like training master gardeners, and move into research and academics.

In the two years since she started at UDC, O'Hara has transformed the farm into the organic embodiment of that old maxim: Give a man a fish, and you feed him for a day; show him how to catch fish, and you feed him for a lifetime. Sabine has embraced UDC's unique status as an urban land-grant school and broadened Muirkirk's ambitions to include growing healthy, sustainable foods in an urban setting — and passing that knowledge on to those who live in the District.

"I checked, and we're not likely to grow corn and soybeans in the District of Columbia," O'Hara jokes. "Higher education needs to be relevant to the lives of people" in its community.

William Hare, Associate Dean for land-grant programs in CAUSES, expands on that idea.

"We want to increase the number of food producers in the District. We want to increase the number of people [who] are consuming healthy crops in the District," says Hare. "So how do you do that?. . . First, building the model so that you have a demonstration system so that you can train [people] and you can do research."

Muirkirk is an oasis of greenery located just across Old Baltimore Pike from a seemingly endless stretch of faceless industrial buildings. The man in charge of Muirkirk is Mchezaji "Che'"Axum, director of the Center for Urban Agriculture and Gardening Education. An environmental agronomist with more than 20 years experience with the Agricultural Research Service for the U.S. Department of Agriculture, Axum now oversees a farm that, just a few growing seasons ago, planted crops on around three acres.

Today, the area under seed approaches 15 acres, thanks in part to USDA block grants that have helped fund the farm's expansion into specialty and so-called "ethnic" crops. Crews have cleared acres of trees to open up farmland for Axum and his small team of assistants, contractors, volunteers and students to go about their work. They've planted seeds in plots large and small, whether inside a massive moveable greenhouse called Rolling Thunder or in tiny elevated beds. They're even experimenting with aquaponics to create nutrient-dense wastewater to potentially irrigate crops.

As a research farm with an agenda larger than selling fruits and vegetables for a profit, Muirkirk strives to answer questions about agriculture grown in the D.C. area's specific climate. Among the current projects, Axum and team are testing crops that require little light as well as a low-growing variety of corn that doesn't require as much space as traditional stalks, which can reach the height of your average NBA center. They're also testing what approach works best to cultivate dryland rice: drip irrigation tape placed on the surface of the soil or buried three inches below?

Axum is particularly keen on a project to test crop nutrient densities based on different growing methods. For example, Axum says, he might spray one row of apple trees with a foliage-based fertilizer and then leave another row dry. When the harvest arrives, he says, students could then test apples from each row to see which has absorbed more nutrients.

"What's the point of growing food if it can't be nutritious?" he asks.

Nutrition isn't the first thing that comes to mind when Jaime Montes de Oca discusses the produce from Muirkirk. Montes de Oca is senior executive sous chef at the Hay-Adams, and thanks to Hans Bruland, vice president and general manager of the historic hotel, the chef has direct access to the farm's crops. Bruland met O'Hara, the UDC dean, at a Goethe-Institut reception, and before long, the pair hammered out an agreement. The contract would allow the chef to create his own farm-to-table menu, Bruland says, to "add a little more excitement" to the hotel's staid Lafayette restaurant and Off the Record bar.

Every week, Montes de Oca receives (or picks up himself) many pounds of produce from the farm. It might be microgreens grown exclusively for the Hay-Adams or it might be kale, which the chef uses for a "farmhouse" salad dressed with vinaigrette infused with dehydrated kaffir lime leaves, also grown at Muirkirk. Or it might be the Swiss chard that Montes de Oca, on his hands and knees, harvested in early June.

"That's the beauty of this farm," Montes de Oca says. "I picked this [Swiss chard], and I have had this for almost seven days. And it's almost pristine." Swiss chard from his other vendors, he adds, will "break down after a couple of days."

Montes de Oca has, on occasion, even tapped into the West African and Caribbean produce grown on a section of Muirkirk run by Togo native Yao Afantchao, the ethnic crop development specialist for UDC. Afantchao's goal in growing garden eggs (also known as African eggplant) or super hot chilies such as ghost peppers or Congo chocolates is not necessarily to supply chefs. It's to educate small immigrant farmers, such as those in southern Maryland who once grew tobacco, on how to plant and market their native crops to Americans and fellow immigrants.

"Every one of these crops will grow well" in the mid-Atlantic, says Afantchao. "To me, I think they do even better in this weather than they did in Africa. I grow some very good stuff here in the soil. I think it may be too hot for them in Africa. Here it's a little temperate, and they love it."

One small section of Muirkirk is basically off limits to chefs, whether Montes de Oca or even UDC cooks who want to harvest their own produce for the campus cafeteria. The nearly three-acre patch is called City Orchard, and it's dedicated to all kinds of fruit, from those growing on trees (apples, Asian pears, persimmons) to those huddled closer to the earth (strawberries, blackberries). The crops are grown exclusively for the nonprofit organization Bread for the City, which distributes the fruit to nearly 9,000 needy District residents and families each month via two food pantries.

City Orchard is a way for Bread for the City to have a steady supply of fruit, says Ryan Hill, associate director of development. Fruits have historically been hard to come by, at least when compared to vegetables, which are donated at a higher volume, Hill says. "Fruit is tremendously popular," he adds. "On our shelves, it goes quickly."

Like the rest of Muirkirk Farm, City Orchard also has an educational component, teaching the District's poorest residents about fruits that many take for granted. To some children, Hill says, persimmons and blueberries are as foreign as garden eggs are to many Americans; for this younger generation of Washingtonians, both orchard and the greater Muirkirk Research Farm could play a role in improving not only their knowledge of fruits and vegetables, but also their consumption of them.

"You've got an 8-year-old kid who's never tasted a strawberry," Hill says, clicking off some real-life interactions. "Or another kid who asks, 'Where's the chicken nugget tree?'"

Urban Forestry and Gardening Education

Beyond the research farm, the Center for Urban Agriculture and Gardening Education offers programs in home gardening and urban forestry, providing District residents with information and training to support gardens and promote tree health, with special consideration given to the unique challenges and opportunities of the urban context. Our programs relay the significance and many benefits of urban food production as well as the array of ecological

benefits provided by city trees. Through demonstrations, technical assistance, consultations, workshops and publications, residents are educated about community gardening, tree care, forestry niche crops and invasive species that threaten the city and region.

DC Master Gardeners Program

Active in all 50 states and Canada, the DC Master Gardeners Program was established to assist Cooperative Extension in reaching the consumer horticulture audience. Master Gardeners, revitalized in 2002, is a volunteer program affiliated with landgrant universities through the Cooperative Extension Service. D.C.'s Cooperative Extension - our community education programs - is housed under CAUSES.

Washington, D.C. and Baltimore City are the only metropolitan, inner city Master Gardener Programs on the east coast of the U.S. Volunteers utilize research-based information to educate the public on best practices in horticulture and environmental stewardship. Horticulturalist Sandra Farber-Bandier is the Environmental and Natural Resources Extension Agent and Master and Junior Master Gardener Coordinator.

She has 226 active Master Gardeners in D.C., where she trains participants to go out in the field and teach plant clinics. Sandy also has beautification projects in all eight Wards of D.C. including schools, places of worship, nursing homes and parks. Her Master Gardeners give back 9,000 hours back to the city annually.

The program provides interested individuals with extensive training in topics such as plant pathology, entomology, urban soils, plant propagation, and pruning clinics. In return, participants dedicate volunteer time to teach horticultural information, answer questions, speak at public events and participate in community gardening programs. Nationally, Master Gardeners volunteered more than five million hours in 2012. In 2013, 226 active Master Gardeners gave a total of 9,000 hours valued at $348,210.

Pollinator Education

Pollinating animals such as bees, butterflies, bats and beetles support terrestrial wildlife, providing healthy watershed and more. Honeybees play an important part in our agricultural ecosystem. According to the USDA, one-third of our daily diet comes from honeybee-pollinated crops. Pollen is transported by honeybees, allowing plants to produce fruits, vegetables and seeds. Despite their critical role, these pollinators are being increasingly threatened by extreme weather, parasites and disease, and reductions in forage areas.

Honeybees thrive in pollinator patches, which offer bees blooming opportunities and a variety of flowers to support different bee species, increasing pollinator diversity. In partnership with The SEED School, the University of the District of Columbia Master Gardener Program will celebrate planting a pollinator garden as part of the Bayer Bee Care Program.

"Pollinator forage is essential to the health of honey bees," explained Sandra Farber. "We are delighted to partner with Bayer CropScience and come together with students and industry stakeholders to design and plant a garden to support pollinator health."

Beekeeping was legalized in D.C. under the Urban Agriculture Apiculture Act of 2012 and is regulated by the District Department of the Environment. UDC offers beekeeping courses in partnership in with The DC Beekeepers Alliance and the Northern Virginia Beekeeping Education Consortium.

The UDC farm now has a pollinator garden to address the decline of pollinator populations, which include bees, butterflies, bats and beetles.

Winter Freeze Injury to Plants and Trees

According to Sandy Farber, the 2013-2014 winter delivered more than a few punches to the landscape. The D.C. Metro Area has reported multiple instances of winter injury to flowering and evergreen landscape plants as a result of the winter wallop. While it is not unusual to see some freeze damage after a D.C. winter, this year the extent and severity was notable.

Winter burn was also noticed on many evergreen plants across the area. This winter burn occurs when water is lost from the living tissue faster than the roots can replenish it. When the ground is frozen, the roots are unable to transfer water into the leaf or needle tissues exposed to biting winds and the winter sun. This results in leaf and needle desiccation that appears as bleaching, yellowing or browning, and leaf drop. Damaged plants observed with winter burn include: white pine, arborvitae, rhododendron, boxwood, ivy, etc.

Freeze injury will appear as yellowing, bleaching, browning or crisping up as well. Winter burning may, but not always, appear more uniformly across the exposed plant, or on the windward side. Segments of plants below the snow line may bloom due to the insulating effects of the snow on the buried limbs. If a plant is not near a roadway, winter freeze damage is likely the culprit of early spring browning.

Deer Proof Gardening Tips

As the weather turns warmer, learn how to protect your flowers and plants. Farber discussed plants that deer are less likely to eat and strategies for keeping deer out of your garden for Federal News Radio 1500 AM. The interview was conducted by Shirley Rooker for

the weekly program *Of Consuming Interest*. Here are a few of Sandy's tips to deer-proof your garden:

- Deer do not like thyme and rosemary, but love basil.
- Spray repellent on pantyhose which can then be weaved into the plants that you don't want deer to eat.
- Switch repellent every 7-14 days because deer will quickly get used to it.
- Deer do not eat barberry, an invasive in Rock Creek Park.

Going Native in your Garden

In the landscaping world, why are our native flora continually overlooked, but at what price? Mary Farrah, Urban Gardening and Forestry Outreach Extension explains:

The answer to that question requires a closer look at ecology on a local and even international scale. Our native flora provide breakfast, lunch and dinner, free room and board, and are the preferred tryst location of our native insects.

So why is it a good thing to have native plants in our gardens that serve as bug motels? For several reasons, actually. Not only do native bees, moths, dragon flies, butterflies, flies and birds serve as pollinators, but they rely almost exclusively on our native flora for food.

Our native insects provide the protein-rich diet that our native birds need to survive. Birds, with their charming songs and their enviable ability to fly, rely on having nice, fat and juicy larvae around to create hard eggshells, fatten up their brood, and sustain them for seasonal flights down to warmer climates. Also, our late-fruiting native plants typically produce lipid-rich berries, an important autumnal to winter food source for migrating and overwintering bird species.

Aside from the food and habitat they provide, many of our native perennials are just as attractive as their exotic counterparts and are adapted for our climate, making them a low maintenance option. An increased number of garden centers are carrying native plant varieties.

By replacing our native flora with exotic imports, we are making long term changes to the food web and our ecosystem, for better or worse. So, for the next addition to your garden, how about using native plants?

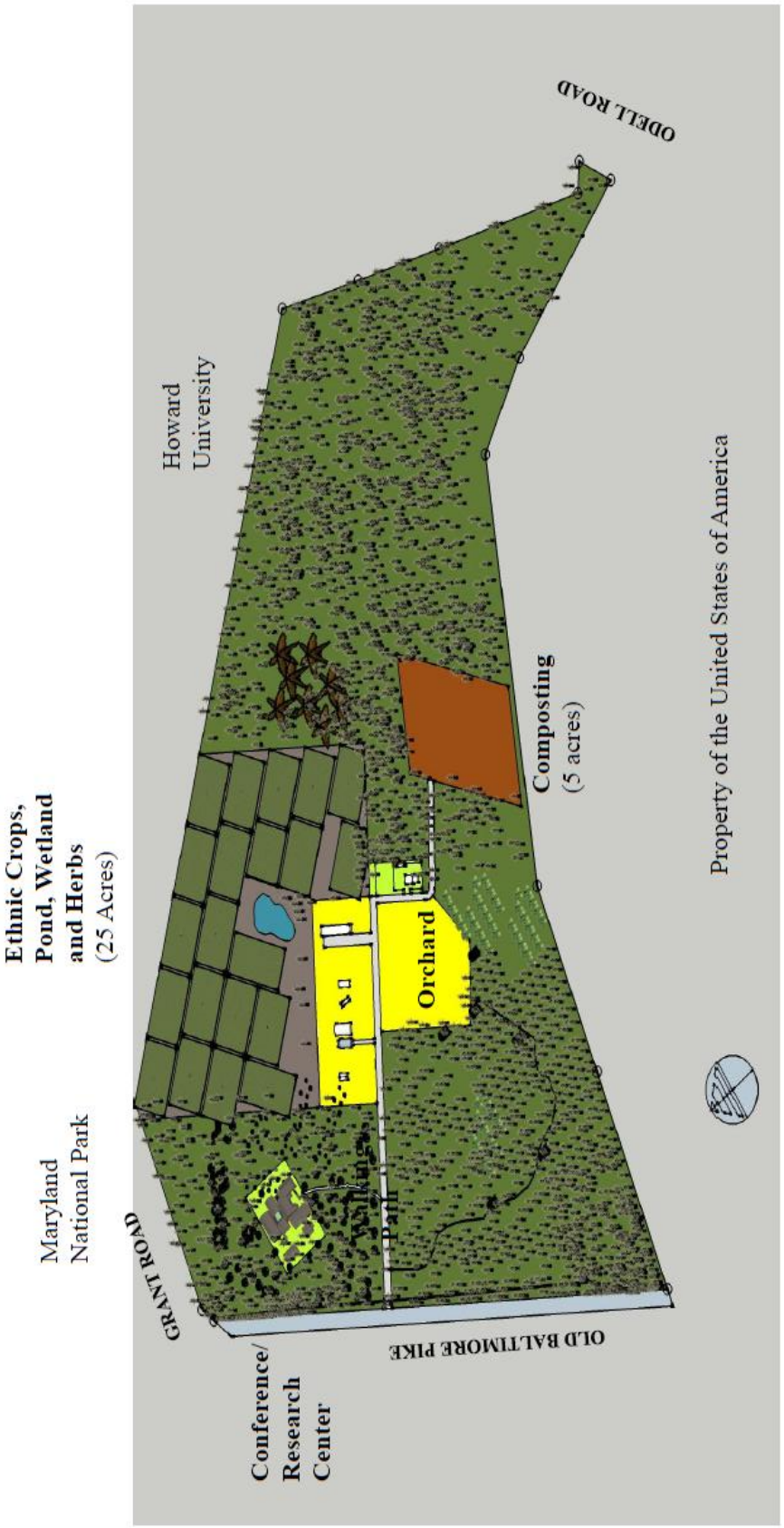
Native Plant Nursery

The University of the District of Columbia was named one of the honorees of the Sustainable DC Innovation Challenge, winning three out of seven grants for a total of $921,000. The grant competition was established to promote novel initiatives among District agencies that will advance Mayor Vincent C. Gray's Sustainable DC Plan that seeks to make the District of Columbia the greenest, healthiest and most sustainable city in the nation. CAUSES was awarded three grants including a $121,500 one to create a native plants nursery to combat invasive plant species and restore native habitats. Once the nursery is completed, onsite workshops will be offered to the D.C. community.

The UDC farm is located at 12001 Old Baltimore Pike Road in Beltsville, Maryland. Che Axum can be reached at mchezaji.axum@udc.edu.

For more information, visit www.udc.edu/causes or our blog http://udc-causes.blogspot.com. And be sure to follow us on Facebook (UofDC.CAUSES) and on Twitter (@UDC_CAUSES)!

Muirkirk Farm Program
Plan View



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