# UFSS 2022 Book of Abstracts

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## Abstract

The 2022 Urban Food Systems Symposium was Sept. 26-28, 2022 at the historic Hotel Kansas City in Kansas City, Missouri. The theme was "Building Coalitions for a Changing World." The symposium brought together more than 200 community leaders, urban planners, not-for-profit administrators, educators, researchers, students and others interested in urban food systems to share and gain knowledge on how to build coalitions, adapt to a changing world and discuss how urban food systems contribute to these solutions. The symposium is held every two years.

The two-day symposium featured a keynote speaker, three invited speakers, 11 oral and two poster sessions. Each oral session featured four 15-minute presentations on related topics ranging from city planning and zoning for urban agriculture, food policy, and Black-led urban agriculture and its transformative local impact, to aquaponics as a solution to climate change, and more. Presentations were followed by 30-minutes of participant discussion and questions to further explore the session's topic and get to know the people working on similar issues in other parts of the U.S. and across the globe. The abstract book includes the invited speakers and the contributed oral and poster speakers for the 2022 UFSS.

## Keywords

symposium, urban food systems

## Presenter Information

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# Urban Food Systems Symposium

## Book of Abstracts

*Building Coalitions for a Changing World*

**September 26-28, 2022 | Kansas City, Missouri**

**For more information visit our website:**
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Kansas State University

Building Coalitions For a Changing World
Urban Food Systems Symposium

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## INVITED SPEAKERS

### We are the Ones - Applying Ecological Principles to Social Design

Pandora Thomas, Caregiver, Teacher, Speaker, Designer, Earth-Lover, Founder and Land Steward: EARTHseed Permaculture Center and Farm, Co-Owner and Designer: Urban Permaculture Institute, Senior Climate Innovation Fellow: Movement Strategy Center

This interactive presentation, rooted in "AfroIndigenous Ecological Principles" will support you in deepening your ability to listen to the lessons of our more than human kin and those that have come before us while assessing you and your own community's assets. You will leave feeling inspired and nourished with tangible tools to apply to your work in service to our human and more than human communities!

### Bridging the Gap between Urban and Rural Farming

Anusuya Rangarajan, Director, Cornell Small Farms Program

In the study titled, "The Promise of Urban Agriculture," we found commercial urban small farms had many creative ways to earn income while delivering on multiple social, environmental and food sovereignty goals. As places that produce food, ideas and entrepreneurs, urban farms have repeatedly been shown to provide benefits that accrue to more people than just the surrounding neighbors. As an urban farm entrepreneur considers scaling up, however, they are faced with challenges of accessing more land and other essential farm resources. Rural places offer an opportunity to grow a farm business, but gaps in culture, diversity, farm practices and supportive networks can thwart the farmer's success. How do we go beyond bridging the gaps or rifts between urban and rural farming, to create the reciprocal, responsive and interdependent farm/food system we imagine? There are several important opportunities for urban farming that are under-developed yet have the potential to reframe all of US agriculture. How we see and understand agriculture's future can guide how we build urban-rural coalitions that bridge the rift and uplift urban farming.

### Extraction to Equity: Leveraging Urban Food Systems for Structural Transformation

Samina Raja, Professor, Urban and Regional Planning, Director, Food Systems Planning and Healthy Communities Lab, Associate Dean for Research and Inclusive Excellence, School of Architecture and Planning, University of Buffalo

Public, private, and philanthropic solutions overlook the political and structural determinants of food inequities, an issue addressed by the speaker Dr. Samina Raja. This oversight was made especially clear in the wake of a mass shooting of grocery shoppers by a white supremacist in one of the very few supermarkets in a historically Black neighborhood in Buffalo, NY, on May 14, 2022. The shooter killed ten people, injured others, and retraumatized an entire community. The Buffalo massacre was a tragic mix of multiple forms of acute and chronic violence. The Black community responded rapidly and purposefully by taking care of its own, a common response in neighborhoods and communities historically neglected by public, private, and philanthropic actors. Black-led urban farms, food cooperatives, and organizations banded together to provide food and mental-health-related support, for example. Responses from outside the community to address food inequities focused primarily on short-term solutions, though, following community pressure, some also addressed structural reforms. The extent to which public policy transforms extractive food systems into equitable ones remains to be seen. The speaker will conclude with ideas for leveraging urban food systems for more equitable social transformation.

### Rooted in Relationship

Candace Rashada Mujahid, Program Director for Career Servies and Human Resource Development/Workforce Development, Division of Corporate and Continuing Education, Durham Technical Community College

Jennifer Zuckerman, Director of Strategic Initiatives, World Food Policy Center, Duke University

Power and privilege are entrenched in our food system, especially as it relates to food insecurity. Systems of charity and benevolence hold power in place, maintaining a system of need as opposed to affecting the root causes of hunger. In this session, Candace Rashada Mujahid of Communities in Partnership and Jen Zuckerman of the Duke World Food Policy Center will discuss the negative impacts of charity on Black and Brown communities, how to shift power through relationship, and why food justice is essential for long term food security.

## ORAL SESSION 1

### Challenges of Growing in Urban Areas

Tuesday, September 27 | 1:30 - 3 p.m.

### Practices and barriers to sustainable urban agriculture: A case study of Louisville, Kentucky

Sait Sarr, School of Urban & Public Affairs, University of Louisville

Leigh Whittinghill, Connecticut Agricultural Experiment Station, New Haven, CT 06511, USA

As urban populations increase, there is growing interest in developing innovative technologies, sustainable urban farming practices, policy measures, and other strategies to address key barriers in urban agriculture that impede improved food security and sustained urban livelihoods. We surveyed forty urban farmers and gardeners (growers) in Louisville, Kentucky, for base-level information to assess their agricultural practices and the various factors or key barriers that could influence such practices. Secondary objectives were identifying areas where practices could be improved, and identifying opportunities for research, outreach, and incentives for urban growers to transition to more sustainable and higher-yielding practices. The majority of these urban growers were white females, were more diverse than Kentucky farmers, and attained a higher degree of education than Kentucky residents as a whole. Most were engaged in urban agriculture for non-commercial reasons, and 11% were full-time urban growers operating farms for profit. Smaller farms were less likely to be operated for profit or have farm certifications than medium-sized or larger farms (Chi-squared = 14.459, $p = 0.042$). We found no significant differences among farm sizes in terms of whether growers rented or owned the land they were on (Chi-squared = 9.094, $p = 0.168$). The most common sustainable practices recorded were composting (60%), crop rotation (54%), polyculture (54%), organic farming (49%), and low or no-till (46%). The least common practices were alley cropping (5%), plasticulture (3%), and hydroponics (3%). Challenges faced by these growers included limited space, accessibility to farm certification, presence of pests and diseases, and lack of record keeping and soil testing for fertility and contamination. Our study documents the need for more farm certification, education, outreach, training, research, investment, innovative ideas and solutions, collaboration among stakeholders, and better access to land through favorable urban policies and local support.

### Rooting embodied wisdom for Black futures

Orlando Zane Hunter, Department of Dance and Agricultural Communication, Education, and Leadership, The Ohio State University

Mary Rodriguez, Research advisor

Ricarrdo Valentine, Researcher and Documentation

Over the last 10 years, there has been a resurgence in Urban agriculture in an effort for Black communities to reclaim autonomy over food sources and diets and a way to empower them to engage once again in the agricultural industry. This reconnecting builds collective agency and community resilience (CACR) (White, 2019). The benefits of urban agriculture within Black communities bring spiritual, mental, and physical wellness to the forefront, empowering upward mobility and encouraging an autonomous revenue structure. This research looks to the pioneers of the (CSA) community supported agriculture movement as a rooted framework for self- sufficiency, communal resilience, and land sovereignty (Baszile, 2021).

Art is a way of documenting and connecting individuals with specific subject matter that yields transformative understanding. Specifically, movement is a unique language spoken through the body and can tell stories about the lives and experiences of a person. Food is transportive, movement-based, creative expression that has been shown to improve health outcomes and to expand consciousness, promote healing, and self-awareness (Stuckey & Nobel, 2010). We see movement as an opportunity to engage Black urban growers in self-empowered healing in connection with the environment around them to surpass historical trauma.

This qualitative study used narrative inquiry methodology to explore the ideas of Black growers' relationship to land, growing fresh food, and how those relationships to the earth influence how Black communities can secure and ensure future growth. Through an innovative participatory interview, we solicited stories from 9 Urban farmers incorporating elements of movement ranging from the grower's contemporary movement and African diasporic agricultural dances that lend to storytelling.

Three emergent themes from one-on-one interviews with Black growers emerged: (1) the generational gap to sustain and transfer agricultural wisdom; (2) reengagement with the earth is vital for Black communities for holistic health and wellbeing; and (3) longevity of urban agriculture persists to be a concern for elder stewards of the earth due to ever changing urban land conditions. This research illustrates a historical narrative of resilience that exists within Black communities' relationship to the earth. These stories are sacred and important to share because Black communities

are so often regulated to urban areas and stigmatized due to lack of access to resources and consistently meet structural oppressive forces. As a Black movement artist and grower, I see movement as an expressive way to connect and highlight the dimensionality of the food justice movement.

## Risk perception of heavy metal soil contamination among Indiana urban farmers and gardeners

Nathan L Shoaf, Cooperative Extension Services and Department of Forestry and Natural Resources, Purdue University

Zhao Ma, Department of Forestry and Natural Resources

Over the past several years, interest in urban agriculture has grown in Indiana metropolitan areas. Urban farms and community gardens offer numerous health, social, environmental, and economic benefits. Urban farmers may include those who are just beginning, have limited resources, or are socially disadvantaged. Many of these farmers participate in community gardens growing diverse crops that are critical to feeding local populations and increasing Indiana's economic base of the agricultural industry. However, these farmers and gardeners also face potential risks from human exposure to soil contaminants. One challenge in Indiana has been the lack of available science-based soil contamination information and technical assistance on mitigating the risk of human exposure to soil contaminants. Building upon theories of risk perception, particularly how people perceive slow, long-term environmental risks, this research uses a mixed-methods approach to examine how Indiana urban farmers and gardeners perceive the risk of exposure to soil contaminants and their interest in soil testing and management practices. Participant observation and semi-structured interviews with farmers and gardeners were conducted in five Indiana metropolitan areas. These qualitative results will inform the development of a statewide survey. Our preliminary findings show that urban farmers and gardeners do perceive the risk of soil contaminants, particularly of heavy metals from nearby industrial development. Some have over applied composts to their soils and implemented raised beds to mitigate such risk. However, there has been limited soil testing and a sense of reluctance to do so. This highlights the need for agricultural professionals to better understand the reasons behind urban farmers' and gardeners' reluctance to address the risk of environmental contamination.

## Organic certification (or lack thereof) in Kansas City

Semra Fetahovic, Cultivate KC

Kyra Gross, Brookside Farmer's Market

While acres of organic land have increased, the number of farmers farming organically has either decreased or stagnated depending on the year (Adams, D. C., & Salois, M. J., 2010). One study found that over 70% of fruit and vegetable growers are following organic practices but are not USDA certified (Veldstra et al., 2014; Torres et al., 2016). Smaller farmers, beginning farmers, and farmers selling directly to consumers are less likely to pursue organic certification (Veldstra et al., 2014; Torres et al., 2016). Farmers following organic practices in the Kansas City area were interviewed about their motivations behind either dropping or forgoing certification. Additionally, two National Organic Standards Board (NOSB) members were interviewed to offer expert opinions on the topic. A key figure in the local organic food movement in Kansas City, the Kansas City Food Circle, offers additional insights into local food networks. A multitude of reasons emerge as to why farmers are choosing to forgo or decertify their operations. This research reveals the mismatch between USDA certification and small-scale organic farmers and detects a movement towards local and regional production and consumption of organic products.

An alternative approach to certification can be found locally at the Brookside Farmers Market (BFM). BFM is a vendor-run market championing organic, sustainable, and regenerative agricultural practices since 2003. BFM's farmers and ranchers developed a Participatory Guarantee System (PGS) made popular by IFOAM (International Federation of Organic Agricultural Movements) who advocate and assist in Participatory Guarantee Systems around the world. PGSs are locally focused quality assurance systems. They represent an alternative to third party certification adapted to local markets and short supply chains. The PGS allows 'micro-farms' the ability to demonstrate their organic values directly to consumers. PGS has continued to be the norm at BFM despite the availability of third-party certifications. The conversations regarding organic growing standards predate USDA certification and continue to serve small-scale organic farmers. PGS has been a way to define our farmers' organic growing practices with less administrative strain and, as members of the market, the ability to have a voice in amending the market's standards and guidelines. There is still work that needs to be done in order for the PGS system to be more inclusive and accessible for growers around the KC metro.

## ORAL SESSION 2

### Urban Food Distribution

Tuesday, September 27 | 1:30 - 3 p.m.

### Looking to the past for the future of urban food security solutions

Tom William Phillips, Executive Director, StarkFresh

Retail healthy food offerings are limited in urban communities, forcing reliance on dollar-store or corner store shopping as the only means to purchase food. Those options have little to no fresh produce, meat, dairy, and other food options. These food apartheids had vibrant, viable grocery options in the 20th century, and decades of systemic racism, poor political decisions, and the consolidation and politicism of the food supply chain have left these areas without hope for a traditional retail grocery solution. Learn how StarkFresh took their successful Mobile Grocery Market model that we've operated since 2014 and adapted it to open a brick-and-mortar location in downtown Canton, Ohio in October 2020, in the middle of a neighborhood that hadn't seen a viable grocery solution since the 1960s. Learn how the local food system combined with unique partnerships and incentive programs were used to be able to offer affordable, fresh food options. Learn the trials and tribulations we learned along the way and how, in our full second year of operation, we're adapting the model further and planning on opening up additional stores throughout our County, proving that small-footprint, neighborhood-size grocery stores are the future of fighting food accessibility in urban communities.

### Community responses to food insecurity during COVID-19

Nicole Josiane Kennard. Plants, Photosynthesis and Soil, School of Biosciences, University of Sheffield

The COVID-19 pandemic gave rise to a group of newly food insecure people and also deepened the hardship for those already food insecure. The crisis disrupted national food supplies and created challenges to accessing and utilizing the food that was available. As financial struggle deepened for people, and some became unable to shop for food or cook due to isolation requirements and illness, many turned to community organizations to obtain food. In Sheffield, England, small community food organizations soon became the leaders of the city's emergency food response. One example is Foodhall Project CIC, a social food organization which had previously operated as a contribute-what-you-can café serving meals from surplus food. Foodhall soon became one of the largest free emergency food responses in Sheffield. They delivered food parcels five days a week to people's homes, requiring no proof of need to receive food. In collaboration with Foodhall, this research project explores the experiences of accessing food and the roles of community food responses during the pandemic. Fourteen adults who were receiving free food parcels from Foodhall were interviewed in August 2020. Participants were asked to discuss their methods of accessing food during the first few months of the pandemic; experiences interacting with food support projects; coping strategies to food insecurity; changes in finances; and support networks and social interaction with others during the lock down. This research uncovered a wide range of barriers to accessing food that sat atop financial struggles for many participants, including social isolation, personal stigma, changing household structures and relationships, trauma, and mental health challenges. Having and maintaining a social network was an important factor in coping with the burden of food insecurity and in navigating the various routes to find food during a pandemic. This research highlights how community food responses played an important role by encouraging social interaction among people experiencing similar life challenges. During the pandemic, Foodhall made routine wellbeing calls to those receiving food parcels. Outside of social restrictions, Foodhall's café encouraged people to meet in a comfortable and unstigmatized setting around warm meals. Foodhall works with local farmers and shops to source waste food and with mental health charities to provide holistic support for their visitors. This organization provides an example of how food-based and community groups in cities can collaborate to build local food systems that provide for both producers and consumers and that can respond to local challenges and needs.

### Working to bridge the urban rural divide in the Kansas City food system

Katie Nixon, Food Systems, West Central Missouri Community Action Agency

Cristina Jopling

West Central Missouri Community Action Agency (West Central) has been engaged in food value chain work to strengthen urban and rural connections in the food system. We have done this through partnerships with other NGO's and farm businesses. One of the key partners in this work is the Kansas City Food Hub. The collaborative partnership between West Central and the KC Food Hub has been a win/win. The KC Food Hub gets support for staff nd building capacity, while West Central gets to help the farmers we work with plug into a ready to sell market. The KC Food Hub is a farmer owned and farmer run cooperative that markets

and delivers farmers products into the KC market. They spend a lot of time cultivating buyers hungry for local food and building this market, so the farmer owners have a place to sell. However, supply and demand can be tricky. As the KC Food hub grows more and cultivates a larger local food market, they need more supply. This is where the partnership with West Central can be of great benefit. The area West Central serves is predominately rural with a large population of farmers. Through our beginning Farmer and Local Food Promotion Programs West Central has been able to match 6 new farmers to the KC Food Hub who are now member owners of the cooperative. This has helped to strengthen the KC Food Hub and add to the supply of local food being sold to the KC market.

## Serving urban consumers during COVID: Insights from the KC Food Hub

Mallory Lynn Rahe, Division of Applied Social Sciences, University of Missouri

Katie Nixon, Kansas City Food Hub

Teresa Kelly, Kansas City Food Hub

Regional food systems have faced substantial market disruptions and opportunities during the COVID-19 pandemic. Outcomes have diverged across geographies and parts of the system as individual safety concerns, local regulations, and supply chain shortages affected consumers purchasing patterns. Individual producers, farmers markets, and food hubs embraced these changes by offering online ordering, home delivery options, and expanded Community Supported Agriculture (CSA) subscriptions. Yet limits to technology access, logistical resources, and grower and staff capacity affected adaption rates. Azizi Fardkhales and Lincoln, 2021 report that food hubs in Hawaii nearly quadrupled their sales and more than doubled their employment, while urban farmers markets in Washington D.C. experienced a significant decline (O'Hara et al., 2021).

Throughout the past two years, the regional food system has grappled with how to improve connections between producers and consumers. Federal programs to expand food access allowed some parts of the regional food system to access additional demand. The success of some of these projects has led some to argue that the strength and resilience of the regional food system should be prioritized in future governmental programs to provide emergency food aid (Held, 2021). When the pandemic began many food hubs were largely reliant on wholesale buyers and had to pivot to a direct-to-consumer model to support sales (Bomstein, 2021). The Kansas City Food Hub, a producer owned cooperative, faced this same market shift and relied on consumer surveys to refine their direct-to-consumer efforts.

An analysis of 2020 Kansas City Food Hub Neighborhood Farm Share subscriber surveys provides insights into urban consumer demand for an aggregated food box subscription service. We analyze these data by a consumer's previous experience buying local as well as their household size and reliance on the food box subscription for their total produce needs. The Kansas City Food Hub used these consumer insights as well as information gathered from producer members to continue to adapt the subscription service throughout 2020 and 2021. Urban customers had an increased opportunity to engage with local and regional food systems during the COVID-19 pandemic as the availability or safety of traditional food purchasing channels changed. Meeting consumer demand required differentiating the products offered, additional efforts to educate consumers, and a significant increase in labor to assemble and deliver boxes.

## ORAL SESSION 3

### Community and Economic Development

Tuesday, September 27 | 1:30 - 3 p.m.

### Using community-engaged research to expand the customer base of farmers market shoppers

Julia Van Soelen Kim, University of California Cooperative Extension, University of California Agriculture & Natural Resources

Suzanne Grady, Petaluma Bounty

Susan Garcia, Center for Well-Being

Gail Feenstra, University of California Sustainable Research & Education Program

Yulia Baltusova Lamoureaux; Vikram Koundinya

This presentation will share findings from a 3-year community-engaged study to expand the customer-base of farmers market shoppers and provide a toolkit for other urban food systems practitioners interested in researching their own local context. Leveraging data collected through environmental scans, focus groups, and surveys conducted in English and Spanish, we identify barriers for SNAP users and Latinx customers to shop at farmers' markets located in Sonoma County, California. Working with diverse stakeholders including market managers, vendors, and customers, we share research-based solutions to these barriers, including marketing, structural, and operational innovations to make farmers' markets more inclusive and welcoming for the whole community. Ultimately, through robust community engagement and thoughtfully designed interventions, we seek to improve the financial viability of farmers' market vendors, support regional economic development, and expand community health.

### Black-led urban agriculture and transformative local impact

Lauren Forbes, Political Science, University of Cincinnati

While the significance of Black, indigenous, and people of color led urban agriculture is increasingly being recognized among food systems actors, relatively little is known about their motivations, strategies, and local impact in the high poverty communities that they serve. In this mixed methods study, I ask if and how Black-led urban farms might be uniquely positioned to generate equitable development and transformative local impact in neighborhoods of segregated urban poverty. I also establish a means of measuring this kind of social impact and distinguish it from mainstream measures of development in high poverty areas that often minimize equity and prioritize economic over social impact. Using semi-structured interviews with Black urban growers in three distinct cities (Portland, Oregon, Atlanta, Georgia and Detroit, Michigan) and a national survey of urban farms, findings are presented about the shared characteristics that distinguish the nature and impact of Black-led urban agriculture within low-income, racialized communities. A conceptual model of "structural (re)engineering" is also introduced and tested as a proxy of transformative local impact. This study finds that the motivations, priorities, and local impact of Black-led urban farms are largely consistent across each urban context and are connected to intergenerational objectives of Black community survival and resilience. I also find that the objectives and strategies through which Black urban growers seek to achieve their goals are deeply connected to their experienced racial identity and cultural heritage. Testing of the structural (re)engineering model provides preliminary support for both my hypothesis and the practical utility of the impact measures. Finally, I present policy recommendations about how to support equitable development in high poverty communities through the work of Black urban growers and other equity-oriented urban growers that are building alternative local food systems within high poverty contexts.

### Positioning Extension in community food system development

Monica Petrella, Hillsborough County Extension

Land Grant Universities and their corresponding Extension Services have provided immense value to agricultural communities and rural economies for over a century. However, in Hillsborough County where the major metropolis Tampa, FL is located, urban residents are largely unaware of Extension or the services it can provide. In 2019, Hillsborough County government invested in the position of a Food System Program Coordinator as the start to a county-wide food system program rooted in community and economic development. Hillsborough County has a unique approach to the positioning of this Coordinator as someone who works as a liaison between more traditional community development channels while educating the community on the value of Extension.

In this oral presentation Monica Petrella, the current Food System Program Coordinator, will share the strategy behind this positioning and discuss some of the strengths and weaknesses that have been discovered. Furthermore, she will discuss and utilize visual models to expand on the strategy of leveraging Extension's credibility along with the County's reach to contribute to robust coalition building for the forthcoming county wide food system initiative, Homegrown Hillsborough.

Homegrown Hillsborough is slated to be "a coalition of community partners working to support food system initiatives in Hillsborough County, Florida". Homegrown Hillsborough will strive to provide continuous opportunities for all residents of Hillsborough County to learn more about the food system and take an active role in food system development. Urban food systems play a substantial role in this as they are generally underutilized or overlooked in the traditional Extension programs. As Extension modernizes to meet the needs of 2022 and beyond, the Food System Program Coordinator is tasked with making sure Extension services have a positive impact on both traditional rural economies as well as emerging and established urban food systems. This presentation will educate conference attendees on Hillsborough County's emerging food system model as well as discuss more intricate details of coalition development and how it relates to the advancement of a robust urban food system.

## Local planning and the food systems: Tools for increasing access to healthy food

Lihlani Skipper Nelson, Center for Agriculture and Food Systems, Vermont Law School

Ross Daniels, WSP

Local Planning and the Food System: Tools for Increasing Access to Healthy Food" is a Healthy Food Policy Project (HFPP)* resource that discusses how community planners can use existing and innovative tools to support and build local and regional food systems with a goal of increasing access to healthy food. The planning discipline itself has historically focused on physical design and infrastructure, leaving food systems at the margins of planning practice. Where food could be grown, processed, and sold has generally been viewed as a byproduct of land use allowances rather than of intentional or strategic plans. However, recent years have seen a growing interest in how planning can be used to increase access to healthy food and support local food production including urban agriculture. The field of food systems planning has risen in status in the 21st century, from 2004 when a Food System Planning Steering Committee was formed within the American Planning Association (APA) to 2020 when the APA officially designated a Food Systems Division.

Food systems planning is an opportunity to improve community health, create economic opportunities, support improved environmental conditions, and address equity issues. This paper provides and overview of planning tools to increase access to healthy food including: urban growth boundaries, transfer of development rights, urban agricultural ordinances, planned unit development, land use permissions for processing, overlay districting, incentive zoning, complete streets, transit-oriented development, tax-increment financing, and comprehensive planning. The paper also contemplates the importance of the planning process and community engagement, noting that planners should broaden their outreach strategies and strive to have as much representation and engagement from those who are most affected and those who have historically been left out of the conversation. An inclusive process should go beyond traditional participatory planning practices and must acknowledge and embrace the expertise and experience within communities, and concludes with a discussion of challenges and opportunities including equity considerations, monitoring and evaluation challenges, and implementation challenges.

*HFPP is a collaboration of the Center for Agriculture and Food Systems at Vermont Law School (CAFS), the Public Health Law Center (PHLC), and the Rudd Center for Food Policy and Obesity at the University of Connecticut. It is funded by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

## ORAL SESSION 4

### Food Systems Policy and Advocacy

Tuesday, September 27 | 1:30 - 3 p.m.

### Civic agriculture through the lens of Mary Parker Follett's Writings: Pulling at the civic roots of civic agriculture

Rebekkah Stuteville, School of Applied and Interdisciplinary Studies, Kansas State University, Olathe

The deep connections between agriculture and democracy are rooted in American political thought since the time of the nation's founding, particularly in the writings of Thomas Jefferson. More recent efforts to connect agriculture and democracy are expressed in the ideas of civic agriculture and food democracy. These 21st Century concepts renew interest in agriculture's contributions to the classic dilemmas of the individual's relationship to the community and the role of power in the American political system. This presentation will examine key elements of Thomas Lyson's model of civic agriculture and how these elements are amplified and explained through the work of the late 19th and early 20th century social and political theorist, Mary Parker Follett. The objective is to build upon civic agriculture theory by exploring the model's connections to Follett's theories on the group process, community, power, and expertise, and how her concepts apply to food system examples. Follett's theories provide support for civic agriculture's potential to build community, develop civic capacity, and recast power. The presentation will also examine links among Lyson, Follett, and Neva Hassanein's 2008 description of food democracy. An underlying theme of the presentation is that civic agriculture neighborhoods may coalesce within larger communities, and these neighborhoods may help participants acquire the skills of civic association and collective problem-solving. The skills learned by participants in civic agriculture neighborhood groups may yield benefits for food democracy at regional, national, and global levels. The presentation is intended to enhance current efforts in food system policy and advocacy.

### Strengthening policy making infrastructure: Ensuring food is considered in all policies

Cortney Beth Szafran, Policy & Development, Florida Food Policy Council; Vermont Law School

The goal of this paper is to provide community members the means to advocate for a holistic, regenerative food system that provides dignity to all inhabitants. Unfortunately, many governments do not have food system internal coordination or structure for knowledge gathering & sharing. Thus, the food system is often overlooked when enacting policies.

A holistic, regenerative food system positively impacts every community member's life. The positive impacts include their internal lives—physical and mental health—as well as civic and work lives. The food system is comprised of and affected by many different components and participants. The components include economic access, housing, nutrition, public transportation, work opportunities, financial institutions, food aid, land use, food preferences, zoning, distribution systems, and many more. Participants include direct contributors, system influencers, and the environment. Thus, the food system impacts pretty much every aspect of community members' lives.

Governmental policy is key to creating a more holistic, regenerative food system. Policy Makers are system influencers, creating the structure of our societies through law and policy. The created structure includes the food system. Thus, the law and policy decisions made by policy makers impact each person in the community.

This paper is split into three parts; the first is the Background on the Food System, split into three categories: (1) Food System Participants, (2) Agroecology, and (3) Community Impact. This part sets a base for understanding the food system, allowing community members to understand how governmental policy impacts the food system and their daily lives. The second part of this paper discusses methods for strengthening policy making infrastructure. The internal coordination section includes: (1) creating a government position for a Food System Planner; (2) establishing a Food Policy Council & City Council Committee; and (3) creating a Food in All Policies Initiative. The knowledge gathering & sharing section includes: (1) assessments to conduct, (2) plan monitoring and evaluation, and (3) community engagement. The third part of this paper catalogues types of policies negatively and positively impacting the food system, ideas for strengthening these policies, and examples of communities' policies. This will include land use; conservation; transportation; housing; community, economic, and workforce development; utilities; and governmental institutions.

## The Effectiveness of Food Policy and Leadership in Major United States Cities: an examination of food policy councils

Camille Range, College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES), University of the District of Columbia

Sabine O'Hara, College of Agriculture, Urban Sustainability and Environmental Sciences, University of the District of Columbia

The United States food system is comprised of a diversity of stakeholders representing a broad range of sectors including agriculture, health, hospitality, and various other economic sectors. The breadth of food systems stakeholders is evident in the inclusion of both production agriculture and consumer subsidies for special populations in the United States Farm Bill. Programs representing the consumer side include the Supplemental Nutrition Assistance Program (SNAP), Woman Infant and Children (WIC) and Senior Farmers Market programs. The production side ranges from cash crops to specialty and ethnic crops, animal husbandry and energy production. All are examples of how food policy simultaneously impacts health outcomes and local economies. Coordinating these wide-ranging aspects of the food system is challenging and has historically taken place under the umbrella of the United Stated Department of Agriculture and its counterparts at the state level. The representation of Urban Agriculture has been especially challenging since cities do not typically have agriculture agencies. Moreover, equity-centered strategies to address persistent racial inequality which is particularly prevalent in the urban core of American cities, are typically missing. One solution has been the creation of food policy councils, which are relatively recent additions to the landscape of municipal institutions. Ideally, food policy councils are intended to cut across different municipal agencies to coordinate food systems related efforts. Yet questions persist about the effectiveness of food policy councils in addressing the needs of diverse stakeholders and especially the most vulnerable populations suffering from the lowest health outcomes. This research reviews the food policy councils of the twenty-five largest cities in the United States to better understand their current food policy efforts, governance structure as well as their impact on improving the health and well-being of their residents. The review is based on a text analysis of various documents of the food policy councils as well as data on health outcomes in their respective communities. Particular attention is given to the food policy councils' efforts to implement IDEA strategies to address the needs of their stakeholders and advance food and health equity outcomes.

## Planning and zoning for urban agriculture

Andrea Clark, KC Healthy Kids

Urban agriculture is often overlooked in long-range planning and zoning policy. This creates a myriad of problems for urban farmers from accessing affordable land and clean water to legally growing and selling their products.

The Greater KC Food Policy Coalition, a program of KC Healthy Kids, established the Urban Farm Zoning and Planning Task Force in 2019 to examine how planning and zoning impact urban agriculture in the region.

This oral presentation will highlight findings and recommendations from a year of research and engagement, including: barriers to urban agriculture; best practices and resources to plan for urban agriculture; and zoning policies to support urban agriculture.

## ORAL SESSION 5

### Climate Change and Environmental Aspects of Urban Ag

Wednesday, September 28 | 10:30 a.m. - 12 p.m.

### Implementation of closed-loop systems at The Plant

John Edel, Bubbly Dynamics LLC / The Plant

This session will provide examples of closed-loop systems implemented at The Plant, a living laboratory and collaborative community of small food businesses located in the Back of the Yards neighborhood of Chicago. The Plant is owned and operated by Bubbly Dynamics LLC (Bubbly), a social enterprise whose mission is to create replicable models for ecologically responsible and sustainable urban industrial development.

In its past life, the building now known as The Plant was a meatpacking facility until 2007, when the packing company consolidated out of state. The building was vacant until 2010, when Bubbly acquired the property and slowly transformed it into a hub for small food businesses focused on energy and resource efficiencies. Today, The Plant houses over twenty food producers including beer and kombucha brewers, a coffee roaster, a bean-to-bar chocolate company, and indoor and outdoor farms growing lettuces, herbs, microgreens, wheatgrass, and other produce. Bubbly encourages tenant businesses to share resources such as distribution, marketing, recycling and compost systems, and food-grade spaces.

Bubbly facilitates the development of closed-loop systems where the outputs of one business become inputs for another. Products that are considered waste such as heat, carbon dioxide, spent grain, and wastewater are given other uses elsewhere in the building. CO2 is a waste product from the brewing process that usually gets released into the air, where it contributes to global warming as a greenhouse gas. At The Plant, Bubbly Dynamics and Whiner Beer Co. have developed a system that captures a portion of the CO2 produced in the brewing process and transports it to Back of the Yards Algae Sciences (BYAS) and farm uses in the building, where it's used to stimulate plant growth. BYAS and Bubbly collaborate on research including the creation of useful protein extracted from algae, production of a growth stimulant utilizing food waste as an input, and development of creative ways to incorporate alternative protein in our daily diets. BYAS operates a Food Innovation lab, an Algae-Digester lab, a Circular Economy Cellular Agriculture (CECA) lab, and a research grow room in The Plant. In the CECA lab, BYAS conducts research on alternative proteins using an ISO-7 pharmaceutical-grade clean room and 3D printers.

The Plant is a successful example of achieving economies of scale and incubating small food businesses in one facility, while closing loops of waste and energy and taking advantage of the embodied energy from a repurposed industrial building.

### Climate resilient agricultural practices for urban growers in Kansas City

Brien C Darby, Cultivate Kansas City

Ami Freeberg, Cultivate Kansas City

The Kansas City metro is expected to be the fifth most impacted urban environment in the United States with regards to climate change. Research indicates that we will continue to experience increased overall temperatures, increased numbers of heat waves, increased annual precipitation characterized by more extreme precipitation events and longer periods of drought, and increased pest, disease and weed pressure. Furthermore, because of increased heavy downpours throughout the Midwest, Kansas City area farmers report the rains we've experienced (such as the 11" of rain that fell over three days in October of 2018) pulverize their soil, resulting in compaction, poor movement of air and water through the soil surface, and crusting. Farmers across our region have begun to experience production, marketing, and management challenges because of changing weather conditions. Yields have become less predictable, pests and diseases have become more prevalent and damaging, sales at outdoor farmers markets becomes more variable in response to extreme temperatures, rain, and wind, and farm business management and planning have become more challenging because of those changes.

Cultivate Kansas City recognizes that climate change is a threat to existing and future farm businesses and the local food industry. There is a strong need to educate farmers now to be prepared, to be adaptive, and be resilient with the coming changes to our urban and peri-urban environment. As such, Cultivate KC is committed to providing climate resilient education and resources to urban farmers. In 2020, we launched a project, funded by the Missouri Department of Agriculture, to teach and adapt concepts of farm business resilience to a select cohort of urban farms located in and around Kansas City. In partnership with Laura Lengnick of Cultivating Resilience, two cohorts of farmers (n=13) have participated in workshops, site visits, and one-on-one consultations to identify short-term and long-term goals and strategies to make their farm businesses more resilient. Farmers have also participated in insect pest monitoring and have provided that data to Cultivate KC. A post-workshop survey was collected to track the impact of the project,

measuring change in knowledge about agricultural climate resilience, the usefulness the climate resilience planning process used, and plans for implementation. Both cohorts used an online discussion platform to share information. The program launched in January of 2020, so was significantly impacted by the COVID-19 pandemic. The first cohort transitioned from in person workshops to virtual workshops and the second cohort was all virtual, which limited the amount of interpersonal interaction that was initially included in the project to build stronger farmer-to-farmer exchange among the cohorts. Future workshops might benefit from more engagement in person and on participating farms. Our work with these initial cohorts has allowed us to share some of the lessons learned with a wider farmer audience and we are currently working on two new projects to expand the learning to the refugee farmer population we interact with through the New Roots for Refugees program.

## Micro-orchards for community connection and environmental justice

Ashley Noelle Williamson, The Giving Grove

As our climate heats up, and extreme weather patterns become more routine, cities across America are becoming challenged by their aging infrastructure that was never designed to handle such extreme heat waves and severe flooding. Unfortunately, these extreme weather conditions have a disproportionate impact on people of color and people who live in disinvested communities.

The Giving Grove launched in 2013 with a vision to establish environmentally beneficial, sustainable orchards in urban neighborhoods that are vulnerable to environmental changes and health inequities. The idea was simple: work side-by-side with resident leaders and provide them with the disease-resistant trees, tools, and holistic methods they need to care for their own little orchards. The impact exceeded expectations, establishing a nationwide network of food-producing urban greenspaces that increase tree canopy, sequester carbon dioxide, improve and stabilize soil, and reduce stormwater runoff.

Today there are more than 300 of these little orchards taking root in six cities, with four more cities joining the network this spring. Combined, the 330 current sites have the capacity
to produce over 2.9 million servings of fresh food annually, available for free and within walking distance of residents.

Neighborhood interest and involvement drives the creation and maintenance of all Giving Grove orchards. Community leaders champion and maintain the sites, encouraging lasting, generational change. Through this approach, neighbors have more opportunity to meet one another and build relationships, creating a stronger network of community connections. Often located in neighborhoods that suffer the consequences of urban heat zones and low tree canopy, orchards are beneficial to the environment in the surrounding area. With an average of 15 trees, each orchard can sequester approximately 2.7 tons of carbon over 25 years and absorb 500 gallons of water per storm, reducing urban flooding. Trees also help reduce urban air temperatures by 10 degrees on a hot summer day. With dozens (or hundreds) of neighborhood orchards across a city, the impact grows exponentially.

Our team is passionate about the ways an orchard can benefit communities that invite us to work with them. Affiliates in nine cities, from coast to coast, are helping create a powerful network that develops best practices and deep knowledge going directly on (and into) the ground of participating communities, rooting resiliency and sustainability.

## Integrated fish and plant farming: Aquaponics solution to climate change

Teng Yang, Kansas State University

The United Nations' World Population Prospects 2019 estimated that the world's population will rise from 7.7 billion to approximately 9.7 billion by 2050. Facing the rapid increase of population with diminishing water, land and energy resources, sustainable development could be achieved by supporting the expansion of sustainable food production on land and in water, which requires enhancing the efficiency of agricultural and aquacultural production with less energy cost. Aquaponics is an urban food production system that integrates soilless crop production (hydroponics) to raise various edible plants and fish with recirculating wastewater (aquaculture). It emerged in the USA in the early 1970s and has recently seen a resurgence, especially in Europe. The fish are fed and excrete waste, which is broken down by nitrifying bacteria into accessible nutrient for plants growth and uptake (nitrification). Plants utilize these nutrients in the system and clean the wastewater for consistent aquaculture process. Aquaponics not only eliminates wastewater discharge issues, but also enables spent water and nutrients to recirculate in the system because hydroponic component in an aquaponic system performs as biofilter and effectively controls the accumulation of waste nutrients from fish culture. A well-managed aquaponics can improve nutrient retention efficiency, reduce water usage and waste discharges to the environment, and enhance profitability by simultaneously producing two cash crops. By practicing aquaponics systems in non-traditional locations for agriculture or on marginal

lands, aquaponics can function as a sustainable model for food production. This talk provides a full description of the concept of aquaponics, and a brief evolution history of its development as well as basic management strategies. It introduces the main theoretical concepts of aquaponics, then discuss methods and theories of unit design, including the three main methods of aquaponic systems: coupled (one-loop), decoupled, and decoupled (multi-loop) systems, which attached with management guidelines and strategies.

## ORAL SESSION 6

### Extension and Outreach

Wednesday, September 28 | 10:30 a.m. - 12 p.m.

### Food systems practitioner and educational resource database

Kaley Hohenshell, Farm, Food and Enterprise Development, Iowa State University Extension and Outreach

Courtney Long, Iowa State University Extension and Outreach

Local food practitioners across the United States working in urban settings need a wide range of professional experience and qualifications related to the jobs they currently hold.

In 2019 Iowa State University, along with thirty national organizations, engaged in efforts to professionalize the local foods sector by collaboratively understanding and agreeing upon nine categories (Food Systems, Equity, Community Capacity, Economy & Business Development, Government & Policy, Public Health & Wellness, Environment, Leadership and Evaluation), with an additional 41 themes, and 142 competencies with three levels of learning for practitioners working in food systems.

The second phase of this project, funded through a cooperative agreement with USDA AMS is a national Food Systems Practitioner and Educational Resource Database: foodsystemsdb.extension.iastate.edu. This database exists to highlight and lift-up partner networks, educational resources and food systems practitioners and serves as an identification tool for mentorship and learning opportunities related to personal and professional growth.

This presentation will include an overview of the database, potential uses, profile types and next steps involving creating a profile and being engaged in the network. The session will highlight two examples of competencies related to urban food system practitioners so participants can see the range and scope of the database. Participants will learn the difference between a practitioner profile and an educational resource profile and will have an opportunity to create a free profile while in the session.

### The biggest grower - A youth gardening competition for growing specialty crops and urban farmers

Stacy A Adams, Department of Agronomy and Horticulture, Nebraska Extension

Terri James, Nebraska Extension

Youth today have tendencies for unhealthy lifestyles, being sedentary and consuming high fat diets low in fruits and vegetables that sets a precedence for life-long health concerns. School lunch programs provide opportunity for youth to consume balanced diets but does not make a significant change in lifestyle. Research has shown that youth gardening experiences positively impacted individuals through improved activity and healthier food choices. For economically disadvantaged urban and rural households, poor diet is directly attributed to the inaccessibility of fresh produce, affordability, and lack understanding of the preparation and use of fresh produce. Through the NE Specialty Crop Block Funding Program, The Biggest Grower Competition was developed as a summer extension education program for youth in 8th through 12th grade. Project goals were to provide educational resources about home gardening, increase the consumption of fresh fruits and vegetables, and increase availability to family and community. Participants cultivated a garden of their own (80 ft2), collected productivity data, and recorded distribution channels. Behavioral changes were measured through pre and post experience surveys. The program was conducted during the period of June 1 – August 12 in each of 2020 and 2021. Educational content was deployed through Google Drive in modules containing both video and print formats. Small group virtual meetings were held weekly with a Garden Mentor to support content and assist with individual garden care. Participants were invited to come to the university ag campus on week 5 (2021 only) for a one-day, no cost program with engagement activities, garden tours, technology exploration, and networking. Incentives included receiving a gardening multi-tool, gardening book, assorted seeds, colorful logo stickers, and an official participant t-shirt. Data was collected for harvest poundage and method of distribution with the top eight participants receiving gift cards as an incentive for ongoing participation and final submission of data. In 2020 there were 44 participants, of which 57% were new to gardening and, for 2021 there were 17 participants, of which 25% were new gardeners. Individual garden production averages were 47.5 lbs and 51 lbs for 2020 and 2021 respectively and 2,466 lbs of produce was grown in total. Through a post-experience survey, daily produce consumption increased from 12.5% to 36.4%, 72% of the participant's tried a new vegetable/fruit recipe, 91% indicated produce grown was consumed by family, and 18% was donated to food banks.

## Best practices for urban local food entrepreneurs and building regional Extension networks

Julie Garden-Robinson, Department of Health, Nutrition and Exercise Sciences, North Dakota State University

Rebecca West, North Dakota State University

Londa Nwadike, Kansas State University/University of Missouri

Karen Blakeslee, Kansas State University

Shannon Coleman, Iowa State University

Interest in local foods production in the urban environment has been steadily increasing in North Dakota and the surrounding region. Food entrepreneurs are seeking safe and reliable ways to grow, create, and market their fresh or freshly preserved products. Urban consumers are demanding local foods and food products that are fresh and safe. As an increasing number of producers and vendors enter farmers markets and other local food sales channels, these growing small businesses need technical assistance for safe food handling and marketing in the changing world of pandemics and supply chain issues. Although some basic practices, such as hand washing, have been encouraged for decades, the pandemic has shown that they are in constant need of reinforcement. Regulations for small-scale food entrepreneurs vary widely from state to state and can be confusing for both entrepreneurs and consumers. This lack of clarity is an ongoing issue, so a best practices document was created and disseminated throughout the North Central Region.

The North Central Food Safety Extension Network (NCFSEN) has been building a coalition of Extension food safety professionals in our region since 2016. We have implemented a number of activities together, including monthly meetings, building relationships with industry professionals, developing educational materials, and creating a program evaluation tool for our region. Our network has also been working steadily to help other regions establish their own Extension coalitions to better serve their constituents as developed around a particular topic, such as food safety in our case. To that end, we have assembled best practices for creating regional Extension networks.

The following elements will be presented at the conference: 1) background of cottage foods in our region, pre- and post-pandemic; 2) best practices for local food entrepreneurs, including the relevance of "best practices" in view of varying state laws and regulations, health and hygiene policy for employees, volunteers, and family members, market day preparations and contingencies, creating, labeling, and sampling value-added food products; 3) evolving practices for pandemic circumstances in urban markets; 4) building regional Extension coalitions to better serve local constituencies; and 5) best practices for implementing your own regional Extension network, including benefits of regional collaboration, organization, communication, and setting goals. See https://www.ncrfsma.org/north-central-region-food-safety for additional information.

## The Nebraska cottage food industry grows exponentially due to the pandemic

Cindy M Brison, Food, Nutrition and Health, Nebraska Extension

The pandemic allowed the Cottage Food industry to explode, and it shows no sign of stopping! These producers can offer niche products to consumers that fill a need for buying local. Decorated cookies, syrups, and local honey are all examples of products that are contributing to Nebraska's economic wellbeing. Cultural and health related items are very popular also-from kolaches to gluten free breads. This relatively new industry gives a producer with a tasty product the chance to be self-employed and earn extra money. The producer is purchasing local supplies to create their products, and this adds to the Nebraska economy also.

The Nebraska Cottage Food law passed in September of 2019. Over 760 producers have registered with the Nebraska Department of Agriculture to sell their products since then. One of the requirements to register is that the producer must complete a required food safety training. Nebraska Extension adapted a Cottage Food Safety training from Minnesota Extension, and to date almost 400 individuals have completed it. Nebraska Extension has collaborated with local health departments and the Nebraska Department of Agriculture to provide live virtual trainings and Q & A sessions for producers. The Cottage Food producer is very talented and inventive, and this collaborative group really must stay on top of their game to provide guidance. This group also collaborates with the UNL Food Processing Center, and UNL Food Science to meet the needs of these producers. Our goal is to help producers succeed in their entrepreneurship.

Nebraska Extension's goal is to coordinate services these producers may need, to offer them "one-stop-shopping" when it comes to them getting an answer about non-TCS food items they can sell. From lists of labs that test food to places they can get their well tested, we are there to offer help. Working with all these entities in the state has made our program stronger and brought about further collaborations on other items involving food safety.

A survey was sent out to producers participating in the UNL food safety training in the fall of 2021. The results were astounding. Most producers were selling Cottage Food items as a side to their full-time job, or as a hobby. Many were selling over $5000 per year of product, and a few were expanding their businesses to sell to grocers and restaurants. Extension is there helping these producers every step of the way.

## ORAL SESSION 7

### Community and Economic Development

Wednesday, September 28 | 10:30 a.m. - 12 p.m.

### Community collaboration for a more resilient and equitable urban food system in Pennsylvania's Monongahela Valley

Justine Lindemann, Department of Agricultural Economics, Sociology, and Education, Penn State University

Theodore Alter, Penn State University

Rochelle Jackson, Black Women's Policy Center

Eric Ewell, Penn State University

Across Pennsylvania's Monongahela (Mon) Valley, urban communities face challenges related to industrial and economic decline and the exodus of resources and amenities, including food system infrastructure. Additionally, systemic and structural racism have resulted in an urban spatial overlay of racial segregation, political disenfranchisement, low-income, food apartheid, disproportionately high rates of incarceration, less access to green space, and shrunken tree canopy. Low-income and historically marginalized communities tend to have disproportionately high levels of food insecurity.

The impacts of these systemic inequities include high rates of female headed households, kinship care, and low-income, with a greater need to access food and income support, affordable and accessible food retail options, and avenues towards more self-determined urban food systems. Indeed, under-resourced and low-income communities often struggle with small business development, entrepreneurship, and the establishment of sustainable and self-determined urban food systems. These same communities tend to face greater levels of food apartheid; they are underserved by food retail outlets and often rely disproportionately on government food and income aids such as SNAP or TANF.

To better understand and address these issues, our team of non-profit professionals, community stakeholders, residents, and multi-disciplinary researchers have built a research and engagement initiative to address challenges related to the socio-spatial, political, economic, and land-based dynamics of the urban agri-food systems in three Mon Valley municipalities: Duquesne, McKeesport, and Clairton.

This talk will present the process undertaken and results from the planning phase of this project. The overarching purpose of this phase was to establish grounded individual and community relationships to guide and inform the collaborative work of this initiative over time. During this phase we convened and facilitated twelve community stakeholder meetings designed to uncover residents' experiences with and knowledge of different aspects of the urban food system. We also did extensive preliminary and background research on socio-economic, spatial, and political data, including community surveys carried out by the Black Women's Policy Center, a main collaborator.

In presenting our findings, we will discuss the processes and competencies central to building community collaborations and stakeholder relationships, drawing upon previous research on the praxis of translational research and engagement in urban spaces. This discussion will demonstrate how this preliminary research has been structured to help scaffold the larger long-run initiative, including more widespread community engagement and collaboration and the co-creation and implementation of community action plans, including new community-based projects for urban food system change.

### Douglas County Kansas partnerships for food resource recovery

Jamie Hofling, Douglas County Sustainability, Douglas County

The Douglas County Sustainability Office is in its second year of a food waste composting pilot at our existing city-owned yard waste compost facility. With this pilot we are exploring the feasibility of food waste integration at the composting facility where infrastructure was already in place. The City of Lawrence Compost Facility, a leader in the state, had been providing ample access to organic soil amendments to residents, gardens, and agricultural producers since 1991; they had not yet explored integration of food waste materials until this pilot.

Through a partnership with City of Lawrence Municipal Services & Operations (MSO) and our local food pantry Just Food, food waste in the form of fruits and vegetables is collected in a large bin outside Just Food and transported weekly by city staff to the city's yard waste compost facility for composting.

Funding for the project comes from a two-year Community Compost and Food Waste Reduction (CCFWR) provided by the U.S. Department of Agriculture (USDA) and Natural Resources Conservation Service (NRCS). The primary goal of CCFWR is to assist local governments with projects that develop and test strategies for planning and implementing municipal compost plans and food waste reduction plans.

We are anticipating that the fruit and vegetable waste will add necessary moisture and nitrogen to the yard waste windrow, causing it to reach more optimal temperatures with more regularity. With proper moisture and ratio of

nitrogen to carbon, we estimate that the test row will compost at a faster rate than the rows that are only yard waste. Data is being collected weekly to test out this hypothesis.

In our first year 23.5K pounds of food waste was successfully kept out of the landfill and instead converted into humus-rich compost. After soil analysis was completed in February 2022 compost was made available to local community gardens and farms. We began the compost pilot in February 2021 and while the grant is due to wrap up in September 2022, MSO has agreed to continue the pilot beyond the end of the grant period to collect substantial data. This project is a great example of governmental and nonprofit collaboration.

## Developing a field guide platform blueprint for community food systems: Local food leadership at the intersection of art, design, entrepreneurship and food making

Melanie Weir, Social Innovation and Sustainability, Goddard College and UC Cooperative Extension

Using an interdisciplinary framework including design thinking, the Sacramento Experiment (tSE) attempts to tackle the City's wicked problem of food insecurity. Acknowledging that local food consumption is below 2%, tSE explores pathways toward the City's Goal of at least 10% consumption of locally produced food, by 2025. Historically, an industrial food producer of commodities like tomatoes, strawberries, citrus fruits, almonds, figs and other Mediterranean produce, tSE asks "what is the role of the market in the ecology of food systems?" and uses mixed-methods arts inquiry and research to capture a "Farm to Fork Capital" portfolio, amidst changing economics, rhythms of the land and movement of residents and visitors. With a focus on identifying roles and partnerships within and at the edges of Downtown Sacramento, tSE uses Poetic Prototyping (ppt) to engage community in place-based experiments at the intersection of local foods leadership, creative capital development, resource management and sustainability. With a focus on dancing with the regional foodshed and industrial food system, tSE builds on a long-held history of food and culture, woven into neighborhood names like "Citrus Heights", street names like "Tomato Alley", and historic buildings like "the Cannery" and "Ice Blocks". tSE's Field Guide Blueprint (FGB) addresses local food leadership, economic development and capacity building, while embracing the spirit of aliveness and principles of wholeness through a "platform vision" approach to resource management and other food systems sectors. The guide connects local food consumption entrepreneurship, artistry, nature connection and experience design with community interests. Inspired by City Repair and Project for Public Places, the guide introduces two platform engines to support capacity building with a focus on team as the idea, in addressing place-based challenges. Building on intergenerational knowledge, and the generation of pockets of joy and connected moments, the guide utilizes tSE and ppt to engage food producers, consumers, partners and stakeholders around a common vision. Using agile strategy to activate change at the neighborhood level, platform vision provides a living systems approach to engaging possibilities through cross-pollination with partners, stakeholders, organizations and institutions focused on health of people, community and planet. Additional focus is on presenting outcomes in ways that might encourage investors to share time, resources and talent supporting the development of sustainable social innovations, built on theoretical foundations, that can be evaluated in relation to community impact and change.

## xCarving out space for small-scale producers through food system coalitions

Courtney Long, Extension, Iowa State University

Tara Dunker, Nebraska Extension

Ben Jewell, Nebraska Extension

Regional food systems provide numerous benefits for urban communities. A strong regional food system brings consumers closer to where their food is produced, reduces transportation costs and associated greenhouse gas emission, and increases economic activity in a local area. For local food producers, a vibrant urban market can also create a reliable customer base for selling their products.

Building resilient food systems for urban areas requires relationships and connectivity with peri-urban and rural communities, where much of the food production occurs. However, in many areas, there is a well-known (or perceived) tension between urban and rural communities, creating challenges to building lasting connections that could provide stability to regional food systems. These tensions can arise from differing values, community dynamics, and additional aspects.

Coalition-building offers one viable approach to bridge the urban-rural gap and create space for difficult and needed conversations to occur to consider strategic and bold visions for community food system creation and support. Creating opportunities for a diverse array of stakeholders to dialogue, connect, and collectively envision their ideal food system is a critical tool for practitioners working in the food system space.

This session will highlight several local and regional food system coalitions developing in Nebraska and Iowa, with perspectives from individual communities, regions, and statewide efforts. In the context of two of the largest commodity producing states, these coalitions are carving out space for small-scale producers to find viable markets and educating local policymakers on the benefits of investing in food systems. Critically, local and regional food system coalitions provide opportunities for relationship building, real connections, and shared goals.

The groundwork for these coalitions is the Local Food Leader (LFL) training created by Iowa State University Extension. Each of the coalition teams came together through the LFL training and continue to connect and learn from each other in their efforts. This session will provide insight into the key components of LFL, how they contribute to efforts to increase resilience in food systems, and how the Nebraska and Iowa coalitions have used LFL to bring stakeholders to the table.

## ORAL SESSION 8

Wednesday, September 28 | 10:30 a.m. - 12 p.m.

### Evaluating Food Sovereignty in Urban Food Systems

Moderator: Monica Petrella, Food System Program Coordinator, UF/IFAS Hillsborough County Extension

The Urban Food Sovereignty Group (UFSG) at the University of South Florida is dedicated to introducing and expanding the concept of food sovereignty within urban settings at home and abroad. Founded in 2019 in USF's Department of Religious Studies, this group aims to support, encourage, and advance interdisciplinary research and action on urban food sovereignty: the right of persons in urban ecosystems to define their own food and agriculture policies and practices, and to produce healthy and culturally appropriate food through their own means using ecologically sound and sustainable methods, independent of industrial food systems.

The UFSG is rooted in the core principles of food sovereignty and food justice. Food sovereignty is about empowering people to produce, choose and consume their own culturally meaningful food. Food Sovereignty is less about feeding people, and more focused on empowering people to nourish themselves and their communities. We are committed to justice, equity, diversity and inclusion, and we encourage the free expression of creative ideas and energies. This allows us to promote human rights, human dignity, and our collective ability to live flourishing lives.

The UFSG aims to be Florida's leading research network for the advancement of food sovereignty and food justice. We encourage critical dialogue and constructive critique of systems that perpetuate structural racism, gender discrimination, and post-colonial forms of domination in the food system and beyond.

This group is rooted in authentic community outreach and connections. This means that much of our work is dedicated to creating valuable relationships between our group, community partners and residents to effectively articulate current power structures in the food system and how a sovereignty lens can work to create equitable development. The UFSG strives to be more than just an advocacy group; we aim to empower our members and constituents to become organizers of their own in order to make meaningful policy change. Coalition building plays an integral role in this goal and it is viewed as the core of our work.

In this panel presentation the UFSG will explain the strategy behind the group's formation as well as some of the practical tools we will use to advance urban food sovereignty in Florida and, hopefully, across the nation.

### What is Food Sovereignty?

William Schanbacher, University of Southern Florida Religious Studies

Global movement to local implementation: Sovereignty vs Security

### Creating Interdisciplinary Teams

Heewon Grey, University of Southern Florida College of Public Health

Integrating Public Health and Food Systems/Food Sovereignty

### Working with Community Organizations Part 1

Winnie Mulamba, University of Southern Florida Sustainability Planner

Working with the St. Pete Youth Farm, Youth Education

### Working with Community Organizations Part 2

Dhalia Bumbaca, The Well/WellFED

Working with Refugees, USF Students, etc.

### Practical Tools and Applications

William Cook, LemonGRAFT

Supply chain development and distribution

## ORAL SESSION 9

### Training and Education

Wednesday, September 28 | 3 - 4:30 p.m.

### From seed to table: Coalition-focused training on controlled environment agriculture initiatives for military veterans

Angela Melissa Cottrell, Missouri Institute for Defense & Energy, University of Missouri - Kansas City

As a built coalition changing the world, the University of Missouri – Kansas City (UMKC), BioGen Ag Systems—a small agricultural machinery and equipment manufacturer located in greater Kansas City, and the Veterans Community Project (VCP)—a non-profit organization focused on ending military veteran homelessness, have created of a sustainable beginning farmer program with specific focus on the military veteran population in Kansas City. While the majority of beginning farmer programs focus on rural farming practices, our proposed effort is focused on urban agriculture solutions as most homeless military veterans live in urban areas.

Our project has three main objectives: (1) Recruit and retain 50 military veteran beginning farmers (MVBF); (2) Transition at least 50% of MVBF to agricultural or farm-STEM part- or full-time employment opportunities; and (3) Develop a veteran, urban, organic, and sustainable-focused pilot program that can be replicated at future VCP site locations by guaranteeing a market for specialty crops.

Our coalition focuses on MVBF through employment, education, and entrepreneurship initiatives. Utilizing three, 20-foot independent model container farms at the VCP Village, military veterans are recruited, selected, and trained on container farm processes, hydroponic systems, technological innovations for increased specialty crop production (farm-STEM training), as well as receive financial, marketing, and entrepreneurship certificate training. Our overarching coalition goal is to establish a pathway to economic viability and independence for MVBF through this pilot program.

### Growing Growers KC: Making impact with a partnership beginning farmer program

Cary Rivard, Horticulture and Natural Resources, Kansas State University (KSU)

Londa Nwadike, Food Science, KSU/University of Missouri

Megan McManus, Horticulture and Natural Resources, KSU

Candice Shoemaker, Urban Food Systems Initiative, KSU

E. Pliakoni, T. Jenkins, Horticulture and Natural Resources, KSU

Despite their contribution to the production of fresh fruits and vegetables for local consumers, beginning and small-scale specialty crop growers face significant challenges to maintain their economic sustainability. In 2017, approximately 60% of all Kansas and Missouri specialty crop operations had a gross revenue of less than $10,000. The Growing Growers KC program was started in 2004 to train new growers in the area through an apprenticeship program that gives participants both in-class and hands-on experience. In 2018, the program underwent a thorough review, which suggested that curricula related to business skills for beginning specialty crop growers in the region are lacking. In 2020, a study was conducted using synchronous and asynchronous methods to define and prioritize the business skills that growers in Kansas and Missouri view as necessary to be profitable. Online survey (n=106) results suggested that farmers place high emphasis on all standard business education curricula. A series of asynchronous and synchronous online focus groups (n=24) revealed themes on business skills, obstacles to profitability, resources, and desired courses surrounding business education. One of the primary topics that was an identified area of need was related to marketing for beginning farmers. A manual was developed to help beginning specialty crop growers increase gross revenue, "Demystifying the Wholesale Market", to outline marketing opportunities and/or best management practices for beginning farmers that are looking to enter the wholesale market in the Kansas City region. As American agriculture continues to evolve with changing market demands and resource availability, the economic sustainability of small-scale growers is critical to a thriving local food system.

## Growing food and access, education and opportunity through collaboration and dedication to hope

Alicia Ellingsworth, KC Farm School at Gibbs Road

Jennifer Thomas, KC Farm School at Gibbs Road

Lydia Nebel, KC Farm School at Gibbs Road

KC Farm School at Gibbs Road generates an inspiring environment transforming Wyandotte County through community-wide, multi-generational, and participatory food projects while providing vocational training, job opportunities, healing, and fun. KC Farm School celebrates our county's rich cultural heritage, and we offer hope in these urgent times. Our neighbors struggle with food insecurity, economic hardship, limited land access, climate change,
soil degradation, disease, and disconnectedness: of the households in the county 53% use SNAP; 19% of residents live below the federal poverty line; 30% of our children go to bed hungry. Less than 80% of our youth finish high school and fewer than 15% graduate college. Wyandotte County considered a 'sacrifice zone', is home to the country's third-largest railyard and suffers environmental degradation due to that industry, silver and limestone mining, and because of aging infrastructure. Still, KC Farm School grows hope by offering education, access, and opportunity to create solutions by working 'with' our neighbors not simply 'for' them. We learn what our neighbors want by asking at quarterly roundtables. 'Let's Grow Wyandotte!' grew from concerns about food insecurity; and today 300+ households engage in the program which provides plants, seeds, supplies, and mentorship empowering participants to grow their own food. Through relationships with school districts, we bring students on-farm, hands-on for farm activities and robust curricula, and we offer farm apprenticeships for youths aged 13-18. We collaborate with farmers through the KC Food Hub, Great Plains Regeneration, the Young Farmers Coalition, and Growing Growers Kansas City to address soil health through regenerative practices. We've created an economic model that provides an opportunity for young farmers and emerging entrepreneurs while increasing food access for our community by hosting a weekly, on-farm farmers market; accepting SNAP, matching with Double-Up Food Bucks, encouraging pay-what-you're-able, and barter agreements to ensure our neighbors have equitable access to nutritious food and education to lead healthy whole lives. This win/win/win model economic model provides our food and education programming at a rate that is determined by the individual participating; some pay less, and some pay more. In three years, KC Farm School has engaged 30,000+ individuals through participatory food projects, on-farm education, and vocational opportunities. On fourteen urban acres, we're creating innovative solutions with our community as we prove that when we all share what we have, we all have what we need. In this space of hope amid despair, good grows.

## Development of a short course on urban and peri-urban food production in Greece

Eleni D. Pliakoni, Horticulture and Natural Resources, Kansas State University

George Nanos, University of Thessaly

Urban and peri-urban food production is a tool to reduce poverty, malnutrition, unemployment, self-esteem, skill development among more positive outcomes. In Greece, many farms are peri-urban, and the involved farmers produce fruits and vegetables for local distribution. Also, many individuals practice fruit and vegetable production in an urban environment without any expertise. However, there is no specialization or field of studies or a specialist in Urban Food Production. Therefore, a need was identified for the development of a short course on Urban and Peri-Urban Food Production that would provide applicable knowledge for managing environmentally friendly urban vacant lots and peri-urban agricultural land to intensively produce vegetables, aromatic/medicinal plants, and fruits. In 2017 as part of the Greek Diaspora Fellowship Program, we developed and delivered a two-weekend long short course. Our main goal was to develop an undergraduate and continuing education curriculum for small-scale local food production. Our target audience were undergraduate students in Agriculture, agriculturists, professional farmers and farmworkers, unemployed citizens, and hobbyist gardeners. The topics covered were: Basic characteristics of Urban Food Production; Natural resource availability and use for urban food production; Community gardens; Open field vegetable growing in the peri-urban environment and the garden; Protected vegetable production for local consumption; Local small-scale fruit tree production; Plant protection in the urban and peri-urban environment; Harvest and handling locally produced fresh commodities. Each participant was required to develop a short project on Urban or Peri-Urban farming with different cases of study including private gardens, schoolyards, and profit-oriented peri-urban cases among others. Course evaluation was very positive from the participants pointing out that knowledge on this subject was well delivered and very useful. The course was offered two weekends in March 2017 at the University of Thessaly Greece and had more than 80 participants. Videos from all lectures were made available at the University's web site. This paper will discuss how the short course was developed and delivered as well as students' evaluations and future needs.

## ORAL SESSION 10

### Urban Food Production Systems

Wednesday, September 28 | 3 - 4:30 p.m.

### Seattle Parks & Recreation's Urban Food Systems Program; Equity in municipal community gardens and orchards

Paris Delaney Yates, Seattle Parks and Recreation, Washington

This presentation is about Seattle Parks and Recreations (SPR) Urban Food Systems (UFS) Program. It will outline the overall mission of Seattle Parks & Recreation (SPR) Urban Food System (UFS) Program, the impact it has on Seattle's urban foodways, and how the intersectionality between garden and orchard maintenance implementation and municipal equity policies can be used for meaningful outreach
and engagement to BIPOC communities. Seattle Parks & Recreations (SPR) Urban Food Systems Program (UFS) has created the UFS Total Tree Care Framework (TTCF) to guide the maintenance of fruit trees located on SPR maintained municipal land. This framework began implementation in January 2019 and is an annual arboricultural plan based on seasonal fruit tree maintenance activities. Seasonal maintenance duties include pruning in winter, spring mulching (tree rings), early summer Integrated Pest Management (IPM) implementation and supplemental irrigation, summer harvesting, and fall composting and IPM implementation. Food produced on UFS managed landscapes are distributed to communities located within a 5-mile radius of growing location. Around 70% of the food harvested is distributed directly to local food banks. The remaining food is distributed by UFS volunteers to community residents and local organizations, and/or used for UFS programs and community events. UFS volunteers are culturally, economically, and generationally diverse. City of Seattle divisional departments are mandated to implement equity policies recommended by the Office of Diversity and Inclusion. The specific policies that guide UFS are the Equity and Environment Initiative and the food action plan. These policies require the food grown on municipal land serve the needs of Seattle's BIPOC community members. UFS actively recruits BIPOC organizations and volunteers to help maintain municipal orchards, implement the TTCF, and distribute healthy nutritious food their community members. This oral presentation will describe the UFS TTCF implementation, its urban environmental impacts, and its cultural impacts on Seattle's BIPOC communities.

### Enhancing the productivity of urban agriculture through an urban-adapted high tunnel system

John Robert Taylor, Department of Plant Sciences and Entomology, University of Rhode Island

Urban communities can benefit from the greater productivity and sustainability of high tunnels, but existing systems may be too large for small sites and unaffordable for growers from historically underserved communities. Tunnels can be obtrusive in the urban landscape, impermeable coverings contribute to stormwater runoff, and soil contamination often demands the use of novel, untested substrates—including waste-derived technosols—in urban production. This University of Rhode Island (URI)-Southside Community Land Trust (SCLT) collaboration developed and evaluated an affordable, urban-adapted system consisting of a scale-appropriate (4.7 m x 10.7 m) tunnel eligible for NRCS EQIP funding, a cap-and-fill system of 100% yard-waste compost over a geotextile barrier, and multifunctional swales for improving stormwater infiltration and tunnel aesthetics. For the 2019 and 2020 summer growing seasons, a polyculture of 14 world crops integral to the foodways of Providence's diverse communities plus two high-value crops, ginger, and turmeric, were grown at URI in a replicated trial comparing the productivity of the high tunnel system with that of an unprotected cap-and-fill system. Three high tunnel systems were also established at SCLT sites in metro Providence in 2021, and local growers were trained on their use.

Total yield per square meter for the world crop polyculture was significantly higher for the high tunnel system (3.1 kg m-2 vs. 1.9 kg m-2 in 2019 and 4.2 kg m-2 vs 2.2 kg m-2 in 2020), as was ginger yield in 2020, the only year in which it was grown in both treatments. The estimated value per square meter of ginger was substantially higher than that of world crops in 2020 ($67 vs. $29 m-2 for the high tunnel system and $36 vs. $17 m-2 for the unprotected treatment). Native plants were successfully established in the swales and effectively captured stormwater runoff, but space limitations prevented their installation at SCLT sites. Taller species cast shade on interior beds, potentially reducing production.

Study results demonstrate this low-tech system can increase the productivity of world crop polycultures, with high-value crops potentially subsidizing food production. Native cut flowers and seeds harvested from swales and spring/winter crops could further enhance system profitability. Additional research is needed 1) to measure the impact of swales on public perception of high tunnel aesthetics, 2) to identify cut flower species compatible with tunnel production and stormwater infiltration, 3) to evaluate alternative methods for managing stormwater on space-limited sites, and 4) to identify optimal crop mixes.

Urban communities can benefit from the greater productivity and sustainability of high tunnel production. However, existing systems may be too large for urban sites and unaffordable for urban agriculturalists, especially those from historically underserved communities. High tunnels can be obtrusive in the urban landscape, and their impermeable covering contributes to stormwater runoff. Contaminated urban soils also demand different soil management strategies from those used in conventional high tunnel production. This collaboration between the University of Rhode Island (URI) and the state's largest urban agriculture service provider, the Southside Community Land Trust (SCLT), developed and evaluated an affordable, urban-adapted system consisting of a scale-appropriate (4.7 m x 10.7 m) high tunnel eligible for NRCS EQIP funding, a raised-bed system for mitigating soil contamination, and multifunctional habitat strips/swales for infiltrating stormwater runoff. For the 2019 and 2020 summer growing seasons, a mix of crops integral to the foodways of Providence's diverse communities (world crops) plus two high-value crops, ginger and turmeric, were grown at URI in a replicated trial comparing the productivity of the high tunnel system with that of unprotected raised beds. Three high tunnel systems were also established at SCLT sites in metro Providence in 2021, and local growers were trained on their use.

In the replicated trial, yields for approximately half of all crop species were significantly higher in the high tunnel system in both years. Total yield per square meter for the world crop mix was also significantly higher for the high tunnel system (3.6 kg m-2 vs. 1.8 kg m-2 in 2019 and 3.9 kg m-2 vs 2.1 kg m-2 in 2020), as was ginger yield in 2020, the only year in which it was grown in both treatments. The estimated value per square meter of ginger was substantially higher than that of world crops in 2020 ($67 vs. $28 m-2 for the high tunnel system and $36 vs. $17 m-2 for the raised bed treatment). Study results show that this low-tech system can substantially increase the productivity of world crops and that high value crops such as ginger can help to subsidize the cost of food crop production for underserved communities. The harvest of native cut flowers and seeds from habitat strips and spring/winter crops could further enhance the profitability of the system. Additional research is needed to identify world crops benefiting from summer high tunnel cultivation.

## Growing city farming together: A Bay Area urban ag needs assessment

Rob Bennaton, Urban Ag & Food Systems Advisor, University of California Cooperative Extension

Julio Contreras, Urban Ag & Food Systems Program, University of California Cooperative Extension

Yulia Baltusova Lamoureaux, UC Davis Doctoral Student

Urban agriculture and food systems in the California Bay Area are multifaceted and intricate. There are many successful models and inspirational stories of coalition building, thousands of pounds of local food production, and overall community empowerment. Our presentation will highlight case examples, challenges, barriers, and recommendations in the University of California Cooperative Extension's (UCCE) Urban Ag & Food Systems Program's (UAFSP) 2019 Bay Area Needs Assessment.

The needs assessment summarizes and discusses research, outreach projects and extension services the UAFSP conducted during the years 2014-2019 in five Bay Area Counties. It comprises both quantitative and qualitative information gathered from soil analysis, research, participatory research, workshop surveys, site visits and technical extension services. Projects include grant projects like USDA Beginning Farmer & Rancher Development Program workshops across California. Also, the program conducted an urban farmer's mini-grant program with the Alameda County Resources Conservation District designed with low entry and an
easy application process. The UAFSP's projects provide a unique snapshot of urban food production systems and challenges growing in urban environments in disenfranchised communities experiencing higher levels of food insecurity and environmental injustice.

One of the assessment's conclusions was that land access, technical education and economic viability remain the highest challenges faced by urban ag and food systems groups. Most groups thrived at the social, cultural and services aspects of producing local affordable food, transforming lives, and serving important roles in their communities as food hubs, green spaces, and empowering sites. But these accomplishments were difficult to achieve due to the economic and political aspects that create an ebb and flow of activity depending on grants, available resources, community, and political stakeholders. A suggested framework for supporting local food production and enhancing local food systems that presenting itself is to support urban residents in becoming community food producers (AB 1990), who can not only grow local food but also safely and legally prepare and package value added

products through CA Cottage Food Act (AB 1616); in the process boosting the local economy and food system by becoming a micro enterprise home kitchen operation (AB 626).

Bennaton, Rob; Contreras, Julio; Baltusova Lamoureaux, Yulia (2020) Growing City Farming Together: Bay Area Urban Ag and Food Systems Needs Assessment. UCCE Urban Ag and Food Systems Program. https://docs.google.com/document/d/0B2Oc_mXmcvdHV1A5cFh1TU85SURSOEpVMVhaY08xUFB2alhv/edit?resourcekey=0-xKKOP7mMJtZTimK7pH63Tg#

## Edible forests and urban agroecology

Naim Edwards, Community Food and Environment Institute, Michigan State University Extension

Edible Forests are landscapes designed to mimic forest ecosystems with a preference for fruit and nut trees. Also known as food forests, these agricultural spaces vary in size and increase the diversity of crops typically grown in urban farms and gardens. The establishment and management of edible forests present opportunities for social, economic, and ecological improvement. Creating a food forest requires collaboration as stakeholders work together to determine appropriate plants, layout, labor, and long-term management. Furthermore, areas within the forest can be designed for gathering and educational activities. Harvests from the forest can often be consumed or sold directly, or they can be processed into value added products creating a revenue stream. Finally, food forests can serve as attractive green spaces that support biodiversity, produce more food crops on less land, and absorb carbon and stormwater more efficiently than farms dominated by annual crops.

The Michigan State University (MSU)- Detroit Partnership for Food, Learning, and Innovation (DPFLI) is cultivating an edible forest on its 3.3-acre site in Detroit. By June 2022, the site will have over thirty varieties of perennial fruit and nut crops established at the site including common and rare crops. The DPFLI is centered in a residential neighborhood where the food forest serves as a community asset. Local residents walk through the site daily and can access food that is not affordable or available in grocery stores. The DPFLI is a Cooperative Extension initiative, and our food forest serves as a teaching tool for educational programming and community engagement. We offer programs in nutrition, wellbeing, food safety, food preservation, cooking, horticulture, and forestry.

This presentation will cover the concept of edible forest and why they are worth integrating into the urban food systems' narrative. I will also highlight aspects of the creation of MSU's first urban food forest at the DPFLI. Attendees will learn strategies for partnerships, issues to consider regarding design and maintenance, and ways to integrate education and engagement into these spaces. More broadly, I will communicate the value of edible forest to connect people to nature, local food, and one another.

## ORAL SESSION 11

### Food Security and Food Safety

Wednesday, September 28 | 3 - 4:30 p.m.

### Building healthy urban food systems: The Double Up Food Bucks Heartland Collaborative

Londa Nwadike, Kansas State Research and Extension and University of Missouri Extension

Donna Martin, Mid-America Regional Council

Lauren Schaumburg, Mid-America Regional Council

Jollyn Tyryfter, University of Missouri Extension

Erin Bishop, Kansas State University Research and Extension

Katie Nixon, West Central Missouri Community Action Agency

Brien Darby, Cultivate Kansas City

The Double Up Food Bucks (DUFB) Heartland collaborative provides a healthy food incentive program for Supplemental Nutrition Assistance Program (SNAP) recipients in Kansas and Missouri, in both urban and rural areas. Research by this project team has shown that more than 70% of SNAP recipients living in underserved parts of Kansas and Missouri, often in urban areas, want healthier options where they shop but cost often deters them from using their limited funds to purchase healthy foods. The two-state collaboration allows program efficiencies, increases customer satisfaction and decreases administrative costs.

Intercept surveys conducted as part of the program's ongoing evaluation found that the majority (98%) of SNAP customers reported the ability to afford more fruits and vegetables because of DUFB. Our collaborative has partnered with 81 farmers markets, farm stands, and grocery stores in Kansas and Missouri to enable SNAP recipients to purchase $504,057 of additional fresh produce from October 2020-August 2021. Between June 2016 and September 2020, over $2.8 million in DUFB incentives were redeemed by SNAP customers in Kansas and Missouri.

This healthy food incentive program, and particularly the collaborative model utilized to implement this program in Kansas and Missouri could be applied elsewhere to benefit SNAP recipients, as well as local farmers selling produce at farmers markets and grocery stores. The collaborative has learned many lessons in implementing this program that can be beneficial to others working in urban food systems. This collaborative involves a broad range of partnering organizations, including Extension programs from two states, a university medical center, a metropolitan planning organization, state governments, and non-governmental organizations working together across two states, in both rural and urban areas, to improve human health. This program can serve as a model for other states to collaborate to improve access to healthy fruits and vegetables for SNAP recipients.

### There's a photon in my water! The application of ultraviolet light technology to enhance the safety of agricultural water

Olivia C. Haley, Department of Horticulture and Natural Resources, Kansas State University

Yeqi Zhao, Kansas State University

Manreet Bhullar, Kansas State University

Trevor Hefley, Kansas State University

Logan Britton, Kansas State University

BACKGROUND AND PURPOSE: Ultraviolet (UV) light is an increasingly investigated alternative to chemical sanitizers for agricultural surface water disinfection as it is effective, user-friendly, and does not produce toxic by-products. However, the relatively high concentration of particulate matter in surface water which "shields" microbes from disinfection is a major challenge to expanding its application in agriculture. The objective of this project was to test the microbial reduction efficacy of two commercial UV reactors in agricultural water. METHOD: The microbial reduction efficacy of the Minipure MIN-9 system was investigated through in-lab validation trials using water inoculated with Escherichia coli, Salmonella Typhimurium, or Listeria innocua; superhume was used to adjust the UV transmission to 20%, 30%, and 40%. An on-farm case study using three agricultural water sources was performed to determine the efficacy of the Minipure MIN-9 and Sarin UV systems in natural agricultural water. Agar-based methodology and Colilert with Quanti-tray/2000 was used to enumerate the surviving microbial population in the in-lab and on-farm trials, respectively. RESULTS/FINDINGS: For in-lab validation, a maximum of 2.96 log reduction was achieved, and was dependent on flow rate ($p < 0.0001$). CONCLUSION: These results demonstrate the efficacy of UV light for treating agricultural water and reducing the microbial risk. Further studies are needed using different UV devices, flow rates and UV-transmissions to develop guidance for growers.

## Identifying challenges in the postharvest supply chain of fresh organic produce

Tricia Jenkins, Department of Horticulture and Natural Resources, Kansas State University-Olathe

Eleni Pliakoni, Department of Horticulture and Natural Resources, Kansas State University-Olathe

Londa Nwadike, Kansas State Research and Extension and University of Missouri Extension

Manreet Bhullar, Department of Horticulture and Natural Resources, Kansas State University-Olathe

Cary Rivard, Candice Shoemaker, Elizabeth Mitcham, Jeffery Brecht, Angelos Deltsidis

The production of organic produce has been steadily increasing in the United States in recent years. The use of appropriate postharvest practices on small-acreage organic farms is critical for minimizing postharvest losses and ensuring the safety of fresh produce. The objectives of this project were to (i) gain a better understanding of the critical needs that organic growers and industry buyers are facing with regard to postharvest handling and safety of their produce (ii) identify the factors limiting produce quality, shelf-life, and microbial safety (iii) identify critical areas in postharvest handling, processing, and food safety of organic produce for targeted research, education, and extension work. A mixed methods qualitative/quantitative study design was used to meet the project objectives. A national online survey was administered to organic produce growers (n=68) and industry buyers of organic produce (n=35). Asynchronous and synchronous online focus groups were conducted to further explore some of the main themes from the online survey results. The results from the survey indicated that both growers and buyers believe that proper temperature management is the most important factor that affects postharvest quality of organic fruits, vegetables, and herbs. Growers cited that a lack of knowledge and financial constraints were the greatest barriers to adopting or improving postharvest handling practices. Similarly, low-cost solutions and infrastructure were the most-cited short answer responses by growers when asked "What research do you think needs to be done to address postharvest safety and quality issues for fresh organic produce?" However, industry buyers of fresh organic produce suggested that methods of improving food safety and prolonging shelf life were important research topics to investigate. The results from this mixed-method approach will guide future research and extension programming with the long-term goal of providing small-acreage organic produce growers with appropriate postharvest handling practices that will reduce postharvest losses, improve food safety, and ultimately increase the availability of organic produce.

## Towards a new food security paradigm: Assets, opportunities & challenges for urban produce recovery coalitions in California

Robert Bennaton, University of California Cooperative Extension Alameda County, University of California Agriculture & Natural Resources

Julia Van Soelen Kim, UC Cooperative Extension Marin County, jvansoelen@ucanr.edu

Suzanne Grady, Petaluma Bounty

Yulia Lamoureaux, University of California Davis

Cristina Chiarella; Alda A.F. Pires; Rachel Surls; Thais M. Ramo; Vikram Koundinya; Erin DiCaprio

California is a landmark setting for studying produce recovery because of its global relevance in agricultural production, its complex network of food recovery organizations, and its environmental and public health regulations. Working as an interdisciplinary team of food systems, urban agriculture, and food safety academics, extension agents, and community practitioners, we identify policy opportunities and constraints for urban food recovery efforts in California and explore the relationship of gleaning organizations to food safety policies and practices. We report on data collected from seven focus groups with 37 participants from the food recovery system held in four metro-areas of California in 2019. We also share the strengths and limitations experienced when conducting an interdisciplinary study related to food safety with academics and community partners.

Findings from our study indicate that a significant common constraint is funding. Emergency food providers identified that food donation incentives coupled with state-level restrictions on food waste entering landfills drives a cycle in which large businesses transfer the burden of disposal of low-quality produce to food banks. Participants from gleaning organizations–or informal volunteer groups and nonprofit organizations that harvest, collect, and redistribute fresh produce–identified lack of sufficient funding to support the work of coordinating harvest, collection, and distribution of excess produce. We also found regulations create important challenges and tensions for both food banks and gleaners. Past and current perceptions about regulations for food recovery in California are a barrier to gleaners' operations and can cause an under-utilization of their potential for food recovery. For food bank participants, regulations that incentivize the food industry to donate excess product for tax benefits or waste reduction can lead to donation of lower quality produce, transferring the problem of food disposal from corporations to food banks. Participants agreed that there is room for improvement of the food system as a whole to enhance food security and reduce food waste. To support the expansion of gleaning and food

recovery efforts, participants expressed need for better coordination within and across food recovery networks and more positive and transparent engagement from regulators with local food recovery networks to gain a better understanding of the specifics of their unique operational constraints. Moreover, given the local and global urgency to find solutions to food waste and food insecurity, the ability of the food system to recover and redirect excess food is a pivotal factor for addressing both issues.

## POSTER SESSION 1

Tuesday, September 27 | 3:30 - 4:15 p.m.

### Growing resilient communities via local food production on vacant urban lots

Ganga M Hettiarachchi, Department of Agronomy, Kansas State University

Sabine Martin, Department of Agronomy

Blasé Leven, Technical Assistance to Brownfields Program, KSU

Resilient communities have access to an adequate food supply and individual or collective food production helps to adapt to challenges posed by natural, health and economic disasters. Interest in gardening has risen dramatically during the current COVID-19 pandemic. Even prior to COVID-19 community gardening initiatives in urban areas were thriving and residents in urban food deserts relied increasingly on community gardens/urban farms to supply fresh, nutritious, and affordable food. The trend toward locally grown produce appears to be increasing even more now. Vacant/blighted/formerly used properties are ubiquitous, especially in environmental justice communities (EJ communities) and may be used for growing crops. Lead is a very common contaminant in urban soils and elevated lead concentrations can cause detrimental health effects in children and adults alike. Through the Kansas State Technical Assistance to Brownfields (TAB) program we educate gardeners on soil testing, resources for sample analysis, and provide recommendation for best management practices based on test results.

### "Sometimes it's more valuable than money:" Using stories and local knowledge to document comprehensive wealth impacts of wild harvesting

Sarah Hultine Massengale, Community Development, University of Missouri Extension

Mary Hendrickson, Interdisciplinary Center for Food Security, University of Missouri-Columbia

Self-procurement strategies such as gardening, hunting, and wild harvesting are often overlooked in the development of local and regional food systems because the informal exchanges of these foods do not contribute to traditional financial impacts (McEntee 2011). Research conducted between 2017-2018 in the Missouri Ozarks partnered with wild harvesters and used narrative inquiry and critical reflection to explore the practice of wild harvesting, motivations for food access strategies, and the comprehensive wealth impacts of wild harvesting in the region. Comprehensive wealth, a USDA –Economic Research Service framework, provides a tool for economic development that considers multiple forms of capital and allows for evaluating a wider range of social, cultural, and other non-financial costs and benefits of local food systems investments within a local place. While the research was conducted in a rural area of Missouri, the results support a growing body of research that recognizes the need for strategies that strengthen both market and informal opportunities to participate in a local food system, whether urban or rural. This presentation will share results and comprehensive wealth indicators developed that could be used to evaluate impacts of wild harvesting activities in urban and rural communities. This project will also highlight the methodology of narrative inquiry to value local knowledge and participation in local food systems research.

### Assessing the social and environmental contributions of food hubs in highly populated metropolitans of the United States

Haniyeh Shariatmadary, College of Agriculture, Urban Sustainability and Environmental Sciences, (CAUSES), University of the District of Columbia

Sabine O'Hara, College of Agriculture, Urban Sustainability and Environmental Sciences, University of the District of Columbia

Urban Food Hubs are a relatively recent addition to the United States food system. This research explores the social and environmental sustainability contributions of urban food hubs by examining forty food hubs that supply specialty crops to densely populated counties across the United States. Information about the food hubs in our sample is available through publicly accessible websites as well as the United States Department of Agriculture (USDA) Food Hub directory. In addition, we use data from the United States Census to assess the regional characteristics of the food hub locations including information about demographic and socio-economic factors. We then define broad categories of social and environmental sustainability impacts including access to fresh unprocessed food for local consumers, consumer and producer engagement, reduced transportation, and reduced waste to assess the sustainability contributions of the food hubs in our sample. Sub-categories within each indicator category provide further information about the sustainability contributions of the forty food hubs in our sample.

## Extension horticulture at A&T provided fresh produce to food insecure urban communities during the Covid-19 pandemic

Sanjun Gu, Cooperative Extension, North Carolina A&T State University

Peter Coffey

John Kimes

Quincey Moffitt

Covid-19 interrupted everyone's life and hit especially hard to underserved, food-insecure urban communities in Guilford County, North Carolina, where The North Carolina A&T State University resides. Although with great limitations imposed by the pandemic, we, the extension horticulture team at N.C. A&T, were able to partially initiate a research project with six high tunnels (tomato, bell pepper, eggplant and melon) in 2020, and extended it to a full-scale integrated project in 2021 with seven high tunnels (beefsteak and cherry tomato, bell pepper, eggplants and English cucumber). We also conducted a high tunnel demonstration project with more than 12 cool-season vegetable species in the fall of 2021.

All produce, organic or organically produced in- and out-of-season vegetables, were donated to the food-insecure communities through our partners after data collection. In 2020, we donated 7,473 pounds through Share the Harvest (6,688 pounds), Out of the Garden Project (1,349) and New Light Missionary Baptist Church (554). In 2021, we donated 22,059 pounds through Share the Harvest (16,320), Second Harvest Food Bank (3,827), New Life Missionary Baptist (946), and Bread of Life Food Pantry (965). The fresh produce greatly helped the families and individuals in need during this challenging time. For example, Share the Harvest has made our produce available to Triad Health Project, Guilford Child Development Food Pantry, Family Promise, Mary's House, Servant House, New Arrivals Institute, One Step Further/Servant Center, Food Not Bombs, Partnership for Community Care, Celia Phelps UMC Food Pantry, Delancey Street, Center for New North Carolinians, Remedy of Community Needs, African Services Coalition, Clarette Sutton, and Amy Murphy the "Chicken Lady". News and Record, the local newspaper, featured our efforts on June 5, 2020, with an article "From the university with love: N.C. A&T's College of Agriculture and Environmental Sciences reaches out to help the community".

## The role of African American women in urban agriculture

Tracy Crump, College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES), University of the District of Columbia

Sabine O'Hara, College of Agriculture, Urban Sustainability and Environmental Science, University of the District of Columbia

Urban Agriculture is a relatively recent addition to the United States food system. Historically, agriculture has been associated with rural space rather than urban and metropolitan areas. Yet the fast majority of food consumers are urban especially in light of the continued trend toward urbanization across the United States and globally. Yet some food has always been produced in cities. One of the most prominent periods of urban food production were the victory gardens of the 1930s and 40s. More recently, the COVID pandemic, reignited a focus on urban food production in light of failing supply chains and the mobility restrictions of seasonal farm workers during the pandemic. This research explores the role urban farms and gardens have played more recently during the pandemic as well as their substantial history in urban communities. This history has been especially influenced by African American households and the women who sought to provide food security for their families and communities.

## Introduction of innovative food labeling technology on fresh produce to improve traceability

Durga Khadka, Department of Horticulture and Natural Resources, Kansas State University

Eleni Pliakoni, Kansas State University

Manreet Bhullar, Kansas State University

Patrick Abeli, Kansas State University

Fresh produce is commonly associated with foodborne disease outbreaks and food recalls, which affects consumers' health and results in significant economic loss. Produce items are traditionally labeled with 4-digit price lookup (PLU) stickers that are attached to the surface. However, those stickers are made of plastic and glue, both of which are environmental contaminants. Also, stickers can easily get detached from produce surface during handling and the capability of tracing is lost when needed. A novel method of labeling, the CO2 laser printing technology (LPT) has been gaining attention in recent years. The performance of this technology, however, varies from produce to produce and information on its effects on post-harvest quality is not

and information on its effects on post-harvest quality is not reported. The objective was to evaluate the effect of CO2 LPT on the postharvest quality of three horticultural crops, 'Red Delicious' apple, cucumber, and green bell pepper (GBP). Produce were procured from a local grocery store. Each produce was printed with the Trotec Speedy 300 CO2 laser engraver machine at the optimal settings. Edible wax (DECCO 651for GBP and DECCO 251 with dilution 1:4 for apple and cucumber) was applied over the printed area and air-dried for 10 mins under room temperature. Treatments included Quick Response (QR)-coded label, 6-digit alphanumeric (text)-coded label, and nontreated control, and were arranged in a completely randomized design. Postharvest quality was evaluated using fresh weight and visual quality ratings (on a scale of 0 to 5, where 5 = best quality and 0= worst quality). Data were recorded every two days for 8 days in GBP and cucumber, and every four days for 16 days in apple. For the QR-code, smartphone QR code scanner application was used to scan the readability. All produce were stored at 90% relative humidity and 4°C temperature throughout the study period. For all treatments, both fresh weight and visual quality ratings were statistically not different (P>0.05) across time in each produce. The visual quality ratings of QR-coded and text-coded treatments did not decline compared to control in all produce throughout the study period. The QR codes had a failure rate of 3.0%, 13.5%, and 18.3% in apple, cucumber, and GBP, respectively, and the failures were more concentrated towards the end of shelf life of produce. The results suggest that the CO2 LPT did not deteriorate the post-harvest quality compared to nontreated control and therefore has the potential to be used in commercial applications to improve traceability.

## Local legislation for better bites: Municipal policy options for healthy food access in stores and restaurants

Amanda Jean Girard Karls J.D., Foodvocate LLC, on behalf of the Health Food Policy Project

Municipal Policy Options for Healthy Food Access in Stores and Restaurants is a Healthy Food Policy Project resource that focuses on ordinances and other formalized municipal policies that address healthy food access in food stores and restaurants. The resource draws on several years of legal research and policy analysis conducted as part of the Healthy Food Policy Project (HFFPP), which identifies and elevates local laws that seek to promote access to healthy food while also contributing to strong local economies, an improved environment, and health equity, with a focus on socially disadvantaged and marginalized groups. HFPP is funded by the National Agricultural Library, Agricultural Research Service, U.S. Department of Agriculture.

In part one, the Municipal Policy Options for Healthy Food Access in Stores and Restaurants resource outlines a range of local-level laws that have been passed to support, encourage, or require retailers to improve healthy food offerings in existing stores such as grocery stores, corner markets, and bodegas. It also explores how local laws can be used to improve siting of and offerings at new stores throughout communities or in specific areas that lack sufficient access to healthy food; and how they can empower consumers with knowledge to make healthier choices. In part two, the resource outlines how municipalities can use legislative policy to encourage better restaurant offerings. It further discusses opportunities to enact laws to either explicitly require healthy restaurant offerings; or discourage or prohibit less healthy restaurant offerings and siting. Specific policy types covered by the resource include tax, zoning and land use, and licensing laws, and laws that create or support voluntary programs.

The resource concludes with high-level discussion of emerging areas of policy in the space, including emergency-related strategies employed during the COVID-19 pandemic. Although HFPP published the resource in 2020, the research that has informed it has continued. This includes the gathering and summarizing of over 150 policies for HFPP's COVID-19 Food Access Municipal Policy Index through much of 2021; and ongoing development of HFPP's Food Policy Database. As of March 1, 2022, nearly 450 policies have been identified and thoughtfully analyzed for that database, with an ongoing effort to continue to build it out. [The author, who leads legal research and analysis for HFPP, will supplement her talk with additional observations and information culled from that ongoing work.]

## Rapid, reliable, economical Pb determination using portable X-ray fluorescence (XRF)

Lawrence C. Davis PhD, Biochemistry and Molecular Biophysics, Kansas State University

Lauren Stevens, Kansas State University

Ganga Hettiarachchi, Kansas State University

Zafer Alasmary, Kansas State University

The increasing popularity of Urban Agriculture/Horticulture offers great potential benefits to millions of urban residents. However, growing edibles in urban areas also presents some significant risks, dependent on history and current status of growing sites. The most common risk in the U.S. is Pb, via rain-splash or wind-blown contaminated soil, and from root contact with soil Pb. An EPA study (EPA/540/R-06/004) indicated that portable XRF instruments could reliably detect heavy metals in diverse contaminated soils. We used a large cache of archived soil samples (Zafer Alasmary PhD

dissertation, 2020, Laboratory- to field-scale investigations to evaluate phosphate amendments and miscanthus for phytostabilization of lead-contaminated military sites) to explore using a portable XRF, defining limits of detection, precision and accuracy of measured levels, in comparison to standard inductively-coupled plasma- optical emission spectroscopy (ICP-OES) of digested soil samples (USEPA Method 3051). Alasmary's samples were 4 replicates of 5 treatments, taken on 4 occasions, sieved to 2.0 and 0.25 mm for each 5-point plot composite sample, analyzed by USEPA Method 3051 in duplicate, with appropriate NIST standards (acceptable recovery limits +/- 20 %). The site had relatively uniform contamination of 1200 +/- 300 mg/kg Pb over the experimental area. Dilutions of this soil with several different low-Pb soils were used to determine the linearity of response to Pb level, and typical limits of detection/ quantitation. Additional site samples were taken under different experimental field treatments, with different methods of laboratory processing of soils, including methods of drying, grinding and sieving soil for XRF analysis. The XRF method consistently yielded somewhat higher Pb values than USEPA Method 3051 for identical samples (without correction for recovery) as noted in EPA/540/R-06/004. More finely sieved, or ground and sieved, samples (0.25 mm) yielded higher
Pb values than sieving to 2.0 mm. Making multiple 25 g subsamples with duplicate readings on different positions per sample, for most soil samples and dilution curves, allowed statistical determination to high precision. The rapid response of XRF allows reading ~80 samples per day, at ~1/10 the cost of ICP-OES, with equivalent precision and accuracy (EPA/540/R-06/004). The XRF should be optimized for Pb measurement, with operators fully trained in its safe and consistent use, to obtain high precision results. The significant cost saving allows more intensive or extensive areal screening of potential crop planting sites at lower cost, with quicker turnaround time, very beneficial on heterogeneously contaminated sites.

## Master Gardener volunteers address urban food insecurity

Mike Hogan, Extension, Ohio State University Extension

More than 800 million individuals worldwide are malnourished. The US has one of the highest standards of living in the world and yet nearly 13% of Americans are food insecure. Food insecurity is a problem facing both urban and rural populations but is especially concentrated in some urban areas of the US. Master Gardener Volunteers have successfully reduced the incidence of food insecurity in neighborhoods in Columbus, Ohio through a dual approach: teaching food insecure residents how to grow fresh fruits and vegetables; and growing fruits and vegetables in community projects to supply neighborhood food pantries. Neighborhood level food insecurity was measured through focus group responses. In the past two years more than 320 Master Gardener Volunteers produced and donated more than 30 tons of fruits and vegetables for neighborhood food pantries; taught more than 4,000 urban residents how to grow their own food; and developed several community food security gardens in urban neighborhoods. This effort required Master Gardener Volunteers to develop some new skills related to understanding urban food systems, poverty and food insecurity, and cultural awareness. This model of engaging Master Gardener Volunteers to address food insecurity in urban neighborhoods can be an integral part of addressing food insecurity in the context of an urban food system. This model can be adapted to urban food systems in many cities in the US.

## A successful communication cycle for engaging your target audience

Charlotte French, Kansas Rural Center

As academics step into the public eye with their important research or barrier-reducing projects, gaining exposure may be difficult. I want to provide straightforward information to increase these projects' footprint and attention by creating a visual aid displaying the importance of "touching" your audience seven times to initiate action. This presentation will provide a visual guide of various methods of communication, the best tools to gain exposure, and how these can be woven together to create a successful promotional campaign. A circular flow of the seven touches mentioned above will give an overview of various communication methods that may be used in a campaign. The seven touches displayed include in-person conversations, advertisements in digital and print form, cross-promotion from like-minded sources, social media engagement, email campaigns, word of mouth, and passive visual exposure. This poster will also contain statistical information to guide viewers to choose the most useful resources based on the demographic they wish to reach. After reviewing this presentation, academics will be better equipped with an improved understanding of how to reach their audience in the urban food system sectors.

## POSTER SESSION 2

Tuesday, September 27 | 4:15 - 5 p.m.

### Why talk about wasted food?

Michelle DeHaven, Environmental Finance Center, Wichita State University

Wasted food is a global problem. 40% of all food in the US goes uneaten and unused and costs approximately $162 billion annually. Meanwhile, 1 in 8 people in the US struggle to put food on the table which results in food insecurity, malnutrition, and many physical, mental, and psychological challenges. There are data and resources available to help communities tackle these challenges; however, many organizations in urban areas struggle to connect with each other to bring the community's food system to an equitable and efficient place.

Our work brings together food system stakeholders to discuss the intersection of wasted food and hungry people. We educate producers, distributors, nonprofit organizations, public agencies, and community groups about how to communicate with various audiences, how to develop resources and how to access existing resources, and how to think strategically about addressing barriers to food loss and waste and feeding hungry people.

Through summits that present topics of interest and provide opportunities for sharing, collaborating, and networking, communities in Kansas, Nebraska, Iowa, and Missouri are able to join together to develop solutions that will lead to healthy, equitable, and sustainable food systems. The summits have invigorated existing groups, initiated new partnerships, and encouraged people across the region to collaborate through community-wide efforts that seek to feed people, protect resources, and experience economic rewards for cities across the world.

### Interdisciplinary graduate certificate in urban food systems at Kansas State University

Candice A Shoemaker, College of Agriculture, Kansas State University

Eleni Pliakoni, Department of Horticulture and Natural Resources, Kansas State University

Jeremy Cowan, Department of Horticulture and Natural Resources, Kansas State University

Cary Rivard, Department of Horticulture and Natural Resources, Kansas State University

Manreet Bhullar, Department of Horticulture and Natural Resources, Kansas State University

Londa Nwadike, Kansas State Research and Extension and University of Missouri Extension

Urban food systems work formally began at Kansas State University with the launch of the Urban Food Systems (UFS) specialization in the Horticulture MS graduate program in 2011 and 2013 in Manhattan and Olathe, respectively. The success of UFS work in graduate education, research, extension, and outreach since then has expanded this work across the university through an Urban Food Systems Initiative (UFSI). The Urban Food Systems Initiative (UFSI) works to develop sustainable urban food systems that are inclusive, resilient, safe, and diverse. The aim of the UFSI is to provide a venue for collaborative, multi-disciplinary, interdisciplinary, and trans-disciplinary work among graduate students, researchers, practitioners, and industry partners. An objective of the UFSI is to train the next generation of leaders and extension educators to facilitate successful and resilient urban food systems. To further this objective, we launched an online graduate certificate in urban food systems in January 2022. The student learning outcomes are: Use a systems perspective to understand the urban environment and its cultural, political, environmental, and economic roles in urban food systems; Analyze and apply critical thinking to inter-relationships within urban food systems, specifically among diet, food production, the environment, climate, and public health; Have proficiency and competency in urban food crop production; Apply selected skills (grant writing, fundraising, non-profit management, advocacy, communication, evidence-based decision rules) as a community organizer, educator, or leader in urban food systems. These outcomes are met through this 12-credit graduate program that consists of 6 required credits and 6 elective credits from approved courses in plant and agricultural sciences, leadership and management, and sociology, economics, and health. Details of the curriculum, student demographics, and program administration of this interdisciplinary program will be presented.

## Accelerating workforce development for the controlled environment agriculture industry

Jeffrey Landau, Agritecture

Anu Rangarajan, Cornell University

Neil Mattson, Cornell University

Uttara Samarakoon, Ohio State University

Cheri Kubota, Ohio State University

In order to better understand the educational and vocational training needs of future farmers in the rapidly expanding greenhouse and vertical farm sector (controlled environment agriculture, or CEA), Cornell University worked with The Ohio State University and Agritecture Consulting to conduct a workshop with current CEA professionals. This workshop, specifically structured using the designing a curriculum or DACUM approach, convened for two days to brainstorm, debate, and finalize a list of duties (responsibilities, such as "manage crop production" or "manage farm labor") and tasks (specific activities, such as "create crop production plans" or "gather production data") that outline the activities of the expert Indoor Farm Operations Manager. The DACUM Research Chart for Indoor Farm Operations Manager provides an industry-led foundation for discussing gaps and opportunities in existing indoor agriculture curricula at Cornell and beyond. Following the DACUM process, our team will create short-term technical training certifications on advanced CEA production and business management to meet current industry needs and expand curriculum content and delivery for a 2-year associate's degree for students interested in entering careers in the CEA industry. The new CEA short-term training and 2-year curriculum will be developed by a unique partnership among universities, community colleges, and industry partners. Guided by our industry advisors, this dynamic program will create pathways and pipelines to increase the number of new employees entering the CEA industry and provide continuous education to enhance the skills of existing employees.

## Making the case for applied on-farm urban agriculture research

Jacqueline Kowalski, Department of Extension, University of Connecticut

Tim McDermott, Ohio State University Extension

Research and Extension faculty often partner with the farmers in rural areas to conduct on-farm research that will benefit the farming community through increased yield, decreased inputs, increased profits, or improved environmental conditions. As the urban agriculture segment of the food system continues to establish a viable niche urban farmers face unique challenges regarding production scale and soil quality and must cope with many of the same issues as rural farmers when managing production challenges such as pest and disease issues. However, most urban farmers have not yet had the opportunity to engage in on-farm research in partnership with Universities or Cooperative Extension Services. This presentation will discuss engaging urban farmers in applied research, how on-urban farm research can help build relationships/partnerships and describe several small-scale on-farm urban agriculture research projects.

## Supporting food truck and mobile food businesses: An Extension education model

Kendra C Wills,  Extension, Michigan State University

Food trucks and mobile food businesses are increasing in popularity – especially in urban environments. There are many attractive qualities of mobile food businesses for food entrepreneurs. For example, mobile food businesses were able to continue operations during the COVID-19 pandemic, have lower startup costs versus a brick-and-mortar restaurant, and are also able to serve a wide variety of markets and venues. Understanding mobile food business best practices is vital, if Extension is to play a role in providing education and resources to food entrepreneurs and economic development professionals in urban centers.

As a Michigan State University Extension Educator and MSU Product Center Innovation Counselor, Kendra Wills provides business counseling to food business entrepreneurs in the Grand Rapids, Michigan metropolitan region daily. In 2021, Mrs. Wills partnered with the Grand Rapids Food Truck Association, the Grand Rapids Fire Department, and the Kent County Health Department to develop an online course focused on starting mobile food businesses in Michigan. The course covers: business plan development, menu development, licensing, marketing, mobile unit selection and more. A separate online course titled, "Mobile Food Business Fire Safety" covers fire safety practices and permitting requirements.

This course was pilot tested by 40 individuals in the summer of 2021 and launched as a free online course in February 2022 with over 125 participants registering in the first three months. The course features videos from five food truck business owners. In June 2022, Mrs. Wills will be partnering with several organizations to hold an in-person mobile food business workshop for Spanish speaking entrepreneurs.

This poster will provide an overview of the course, which can serve as a model for other Extension educators interested in developing a similar course for their community. Since licensing for mobile food business varies from location to

location, unique educational programs on mobile food business licensing would be helpful to entrepreneurs.

To review the "How to Start a Food Truck Business" online course from Michigan State University, visit https://www.canr.msu.edu/courses/how-to-start-a-food-truck-business.

## Building Coalitions for a Changing World through Underrepresented Youth Education Programs

Summer Dawn Santillana, Ag Dean's Office, Diversity Programs Office, Kansas State University

Zelia Wiley, Kansas State University

Lonnie Hobbs, Jr., Kansas State University

Many students, K-12 age, associate agriculture solely with farming and livestock. However, the field of agriculture contains opportunities ranging across numerous aspects of the work industry (i.e., mathematics, laboratory work, and food sciences); all of which combine to produce the items people use and consume daily. This misconception about agriculture is especially true for underrepresented students and urban students, as they have fewer reliable ways of gaining information about agriculture. In fact, the United States Department of Agriculture (USDA) found that 95% of all U.S. producers are white (2017). The lack of diversity within U.S. agriculture leads to large disparities in consumer agricultural knowledge, in turn negatively affecting underrepresented populations. Therefore, to help combat these inequities in knowledge, the Kansas State University (KSU) College of Agriculture/K-State Research and Extension (KSRE) Diversity Programs Office founded the K-State Junior MANRRS (Minorities in Agriculture, Natural Resources, and Related Sciences) Chapter, under the National Society of MANRRS.

The K-State Junior MANRRS Chapter consists of eight institutions from across the U.S., reaching nearly 500 students. The institutions include schools, youth camps, and 4-H extension. K-State Junior MANRRS has the purpose of creating a coalition of institutional support and programming in order to educate and encourage underrepresented minority K-12 students, specifically urban, about the agricultural industry, related sciences, and the opportunities which college can offer. The K-State Junior MANRRS purpose is becoming increasingly important as the world continues to become more diversified. Additionally, this purpose is achieved through programming events, presentations, and advocacy, as well as connecting youth to minority college students in agriculture to foster a sense of community and normality of minorities in ag. Thus, the program connects young urban consumers with agriculture through extension and outreach by utilizing training and education of agriculture overall. Therefore, this research poster is to investigate the impact of K-state's Junior MANRRS programming efforts and outreach.

At the end of each K-State Junior MANRRS programming event, an evaluation is distributed to the students. The evaluation is based upon a 5-point Likert scale, which allows students to rate their increase in knowledge about agricultural systems and rate their program experience. This poster analyzes the success of the summer program as measured by the direction of the desired answers on the student evaluations. The results suggest that the program was effective at reaching a broad demographic audience, increasing the students' knowledge of agricultural sciences, and fostering a sense of belongingness.

## Incorporating language access into agricultural education

Kristin Selby, New Roots for Refugees, Catholic Charities of Northeast Kansas

There are many training and educational resources available for urban growers, yet speakers of other languages often are unable to access these resources due to language barriers. This presentation will share strategies the New Roots for Refugees program has incorporated to make agricultural educational resources accessible to non-native English speakers. New Roots for Refugees, a partnership started in 2008 between Catholic Charities of Northeast Kansas and Cultivate KC, assists resettled refugees in starting independent farm businesses. Many participants communicate predominantly in their native languages, which include Burmese, Hakha Chin, Falam Chin, Karenni, and Swahili. Farmers grow at the Juniper Gardens Training Farm on ¼ acre plots and receive four years of production, marketing, and business management training through farm classes and one-on-one training. New Roots makes programming and education accessible to speakers of other languages through four methods: utilizing interpretation during program activities, using plain language strategies to communicate when interpretation is not possible, teaching targeted English vocabulary to farmers, and training community partners in language access principles. Interpretation in the participants' preferred language is used for any one-on-one or group teaching sessions. Plain language is used in verbal or written communication in English, including a heavy use of images. In the off season, farmers attend English classes where they learn vocabulary for farming including tools, insects, and fruit and vegetable

names. We educate community partners such as extension agents or farmers' market managers about interpretation, plain language skills, and what languages are needed for document translation or interpretation. Language access is crucial to achieving equity in food systems and this presentation will focus on practical solutions to make this goal possible.

## Interdisciplinary gardening and nutrition classes addresses urban food security and health

Miranda Duschack, Cooperative Extension, Lincoln University of Missouri

Mary Bolling, Lincoln University

Jennifer Davis, Lincoln University

Chris Olliges, Lincoln University

Lincoln University Cooperative Extension Innovative Small Farmers' Outreach Program (ISFOP) Urban Agriculture Initiative, and the Lincoln University Cooperative Extension St Louis Urban Impact Center Expanded Food and Nutrition Education Program (EFNEP) offer an interdisciplinary, collaborative program to do comprehensive work around: food security, health and nutrition, and urban gardening for families. According to the University of Missouri Interdisciplinary Center for Food Security, 23% of the residents in the city of St. Louis are classified as "Food Uncertain" based on eligibility for SNAP, WIC, and the National School Lunch Program. This far exceeds the state of Missouri average of 14%. Additionally, according to the City of St. Louis, 12% of African American households live in a census tract classified as low access to healthy food with the nearest grocery store over 1 mile from their home.

Many Lincoln University stakeholders live in food-insecure areas with limited access to high quality fresh fruits and vegetables and continually express interest in growing their own fruits and vegetables. St. Louis constituents also express interest in learning how to process fruits and vegetables safely and incorporate their produce into nutritious and filling recipes and meals for their families which is provided through St. Louis EFNEP programming. This program addresses participants' concerns about weight gain, food safety and access during the continuing COVID-19 pandemic, now in its third calendar year. The LUCE interdisciplinary team facilitated demonstrable positive impact in 2020 and 2021. This poster presents the impacts of the class and the curriculum, supply list, and budget for the purpose of replication at community partners across the State of Missouri.

## Utilization of movable high tunnel production system for improving yield and quality of lettuce

Patrick Abeli, Horticulture and Natural Resources, Kansas State University (KSU)

Luke Lebar, KSU

Kelly Gude, Cary Rivard, Eleni Pliakoni, KSU

Light quality is known to affect the growth and phytochemical content of many crops, including lettuce (Lactuca sativa L.). High tunnel production of lettuce provides many benefits to growers including increased yield due to higher soil temperatures and protection from abiotic stressors, such as strong wind and heavy rains. However, the use of UV-blocking polyethylene films has been shown to lower antioxidant capacity and phenolic content leading to a decrease in nutritional benefit compared to lettuce grown in an open field. Movable high tunnel systems could combine the benefits of standard high tunnel production with the ability to provide full-sun exposure just prior to harvest. Our objective was to conduct a time-course study to determine the pre-harvest interval necessary to optimize yield, phytochemical production, and color in two lettuce cultivars; a red-leaf cultivar ('New Red Fire') and a green leaf cultivar 'Two Star.' Lettuce was sown in early spring of 2018 and 2020 in the movable tunnel system and exposed to 0, 2, 7, or 14 days of full sun prior to harvest. Total marketable yield (TMY), leaf or core length, leaf color (L*a*b* color space), total phenolic content (TPC) and anthocyanin content was measured at harvest. In 2018, TMY was higher after 2 days of exposure compared to 14 days ($p<0.05$) and in 2020 TMY was higher after 7 days of exposure compared to 0 days ($p<0.05$). Leaf length was higher after 7 days of exposure compared to 0 or 2 days of exposure in 2020 regardless of cultivar ($p<0.01$), and in 2018 core length increased with exposure ($p<0.001$). Leaf redness (a*) and anthocyanin content in 'New Red Fire' was not affected by the duration of exposure in 2020, though obvious differences were seen in overall color production by visual inspection. In 2018, leaf redness was significantly higher after 14 days of full sun exposure compared to 0 or 2 days of exposure ($p<0.01$). TPC was higher in 'New Red Fire' than 'Two Star' ($p<0.001$), and highest after 0 days of exposure in 'New Red Fire' ($p<0.05$) but not affected by exposure in 'Two Star.' These results indicate that using a movable tunnel system provides lettuce growers the ability to affect the yield, color, and phytochemical content of their crop to varying degrees based on consumer preference for a given cultivar. This level of flexibility provides high tunnel growers a crucial advantage in marketing their produce.

## Urban environmental stewardship practices pre- and post-pandemic in Kansas City community gardens

Kristin Taylor, Horticulture and Natural Resources, Kansas State University (KSU)

Candice Shoemaker, College of Agriculture, KSU

Eleni Pliakoni, Horticulture and Natural Resources, KSU

Huston Gibson, Landscape Architecture and Regional & Community Planning, KSU

Matthew Sanderson, Sociology, Anthropology, and Social Work and Geography and Geospatial Sciences, KSU

Environmental stewardship is responsible for using and protecting the natural environment through conservation and sustainable practices to enhance ecosystem resilience and human well-being. The term environmental stewardship has been used to refer to such diverse actions as creating habitats, replanting trees, limiting harvests, reducing harmful activities or pollution, creating community gardens, restoring degraded areas, or purchasing more green or sustainable products. Community garden practices can be classified as acts of urban environmental stewardship. Planting a tree, cultivating land, or building a rain garden inside a community space qualifies as reliable resource management and adds to the community. Examining urban environmental stewardship practices at places like community gardens can hold many social, ecological, and economic benefits. Urban gardens are hubs for civic engagement and environmental stewardship in cities that inspire civic restoration and community-based green space tending. This mixed-methods study investigated if the COVID-19 pandemic affected urban environmental stewardship practices in community gardens. Garden leaders in the Kansas City metropolitan area participated in an online survey, online asynchronous discussion questions, and an online focus group. For emerging themes, discussion questions, text, and focus group transcriptions were qualitatively analyzed. Results show that many community garden practices, such as spending times outdoors and in nature, providing a place for physical activity, and producing food became more important in response to the pandemic. Beyond community garden practices, well-being themes emerged in response to the pandemic such as giving gardeners a purpose during the pandemic, providing a community to belong, and being an emotionally and physically safe place. In conclusion, a shock to the system, such as a pandemic, amplifies environmental stewardship practices of a community garden and the value of community gardens to human well-being.

## Food Security and COVID 19

Sabine O'Hara, College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES), University of the District of Columbia

According to the United States Census, in 2020, over 37 million people in the United States are food insecure. Communities of color, especially Black communities, were disproportionally impacted by food insecurity and its adverse effects. In early 2020, the novel coronavirus (COVID-19) began to spread across the United States, disrupting years of progress toward improved food security. This research will examine the status of food insecurity in the United States leading up to the COVID19 pandemic, as well as its current trajectory based on the changed landscape of food insecurity following the pandemic. While the determinants of food insecurity appear to mirror many of the social determinants of health, they are not as well documented. Among its key determinants are race, gender, income, educational attainment, and location. According to Feeding America, 42 million people (1 in 8), including 13 million children (1 in 6), may have experienced food insecurity in 2021. Many people who have been most impacted by the global COVID pandemic were food insecure or at risk of food insecurity before the pandemic. They have been facing even greater hardship since the onset of the pandemic. According to Feeding America, it took nearly ten years following the Great Recession of 2008 for food security to return to pre-recession levels. We examine the social determinants of food insecurity in U.S. metropolitan areas to gain a better understanding of the socio-economic, demographic, and spatial factors that can offer effective leverage points to reduce food insecurity among those most vulnerable to suffering its ill effects.

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*** Names in bold are presenting a talk or poster**

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# Urban Food Systems Symposium

## *Building Coalitions for a Changing World*

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