

Re: 21-0064R - Investigational Hearing - Urban Farming

Dear Madam Chair & Members of the Health, Environment & Technology Committee,

**My role and organization:** I am the UMD Extension Agent for urban agriculture in Baltimore City. The University of Maryland Extension (UME)-Baltimore City is committed to engaging youth and families to help strengthen communities through a community development framework. As the Urban Agriculture Extension Agent, I support Baltimore farmers with one-on-one technical assistance, classes and certification trainings, and applied research.

It would not be appropriate for me to advocate for specific city policies, but I can provide research-based information that I hope will aid your committee's discussions.

**A brief introduction to urban agriculture:**

A brief UMD Extension factsheet with example photos and graphics, titled "What is urban agriculture?" is available online here: <https://extension.umd.edu/resource/what-urban-agriculture> I have attached a copy as a supplement to this testimony.

**Results of a survey of Maryland urban farmers:**

In 2018, I surveyed and interviewed urban farmers in Baltimore City and other urban parts of Maryland about their production practices, goals, barriers to success, and educational interests. Twenty-nine urban farmers participated in the survey. I have attached the published report as a supplement to this testimony, and it is available online here: <https://www.nacaa.com/journal/452eeb58-36c3-44ac-978d-f2999c49ddb9>

The majority of urban farmer survey respondents grew vegetables, fruits, and cut flowers in land based production systems using raised-beds, in-ground growing, and high tunnels. Urban farmers prioritized balancing numerous goals, including producing food for themselves and their communities, creating jobs, and providing income for themselves. Financially, urban farmers were similar to the general farming population, with about half of respondents farming part-time and selling less than \$10,000 of farm products.

When farmers were presented with a list of potential barriers to success, they ranked highest access to credit and financing, available land or buildings to rent or purchase, labor, and marketing assistance. Other barriers farmers shared in their own words were water access, local policies and bureaucracy, and "finding a price point that is attainable for the community, while being able to provide a good quality of life for our employees."

Sincerely,



Neith Little

Extension Agent, Urban Agriculture, University of Maryland Extension

# What is Urban Agriculture?

## What is Urban Agriculture? Examples from Maryland and Beyond

Interest in urban agriculture is high, with many nonprofits, businesses, municipalities, and individuals launching urban agriculture ventures as diverse as vacant-lot vegetable farms, hydroponic greenhouses, backyard chicken coops, youth gardening education programs, native plant nurseries, and therapeutic gardens. These individuals and organizations engage in urban agriculture to achieve a range of private and public goals to: improve their health and economic situations; expand food access in their communities; generate income and jobs; beautify their neighborhoods; educate people about gardening and farming; create a feeling of community; and provide environmental services (Santo, Palmer, & Kim, 2016).

But what is urban agriculture? How is urban agriculture defined by government agencies, researchers, and growers? What does urban agriculture look like? What

production systems and business models do urban producers use?

This factsheet will explore the definition of urban agriculture, with a focus on the state of Maryland. Within urban agriculture, this factsheet will further explore the definition of urban farming. We will introduce readers to the wide variety of production practices and business models that urban growers use, with photographs and examples.

## Most Definitions of Urban and Rural Areas Are Based on Measurements of Population Density and Land Use

Because urban agriculture includes a broad variety of agricultural production systems unified solely by their location in and near urban areas, defining “urban” is necessary for defining “urban agriculture.” Different branches and agencies of the U.S. government use

slightly different thresholds and scales to delineate between urban and rural areas (John & Reynnalls, 2016).

The U.S. Department of Agriculture’s (USDA) Economic Research Service and the Office of Management and Budget define rural and urban at the county level (Cromartie & Parker, 2018; Donovan, 2015). This can be helpful in identifying counties where nearby metropolitan areas are likely to influence prices and markets (Heimlich & Anderson, 2001).

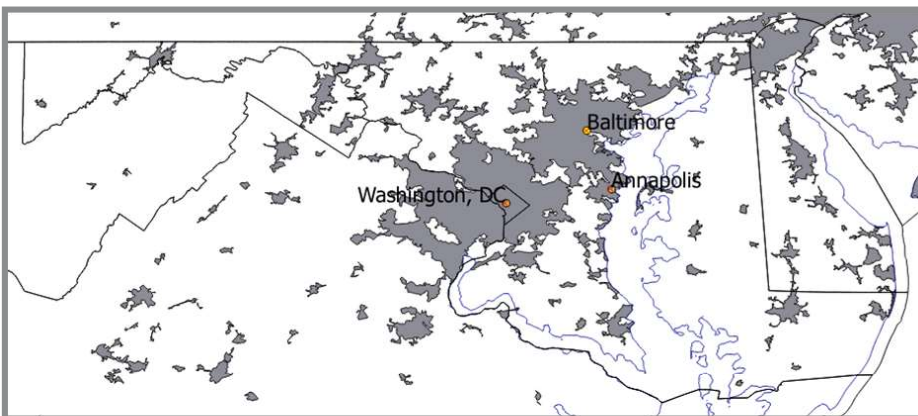


Figure 1: Urbanized Areas in Maryland, as defined by the U.S. Census Bureau.

Map made by Neith Little, using open-access mapping software Grass GIS and TIGERLINE shapefiles provided by the U.S. Census Bureau: <https://www.census.gov/geo/maps-data/>

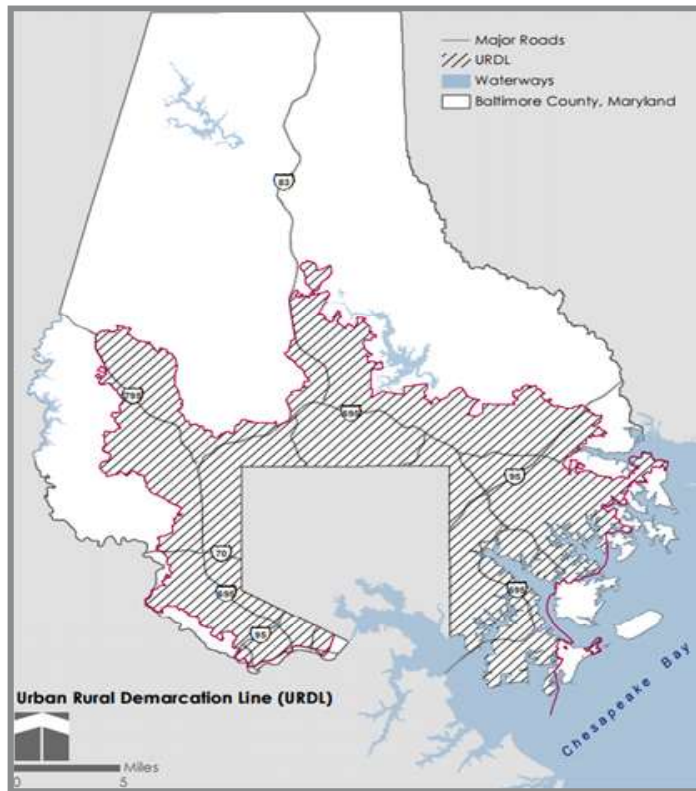


Figure 2: Urban Rural Demarcation Line in Baltimore County, MD.

Mapped by the Baltimore County Planning Department: <http://www.baltimorecountymd.gov/Agencies/planning>

and activities are legally permissible, such as farming, composting, keeping livestock, and constructing roadside farm stands or other agricultural structures. These zoning maps can also be helpful in defining urban agriculture (Figure 2).

### What is the Definition of “Urban Agriculture”?

Wagstaff and Wortman (2013) most concisely defined **urban agriculture** as “*all forms of agricultural production (food and non-food products) occurring within or around cities.*” Government agencies and the peer-reviewed literature have reached consensus on this broad definition of urban agriculture, which includes **all production plants or animals in or near cities, whether for personal use or for sale, whether soil-based or hydroponic** (Diekmann et al., 2016; FAO, 2016; Hendrickson & Porth, 2012; Oberholtzer, Dimitri, & Pressman, 2014; USDA, 2016).

Agriculture in these areas might be considered “peri-urban” (Diekmann et al., 2016; Hendrickson & Porth, 2012; Oberholtzer et al., 2014). To define urban agriculture, however, the U.S. Census Bureau’s Urbanized Areas and Urban Clusters are more useful (Ratcliffe, Burd, Holder, & Fields, 2016) because they are defined and mapped at a more fine-grained scale (Figure 1).

At the local level, zoning boards often differentiate between locations prioritized for urban development and those prioritized for rural open space preservation. How a plot of land is zoned affects which land uses



Figure 3: Outdoor urban agriculture can be done in raised beds or containers, in-ground in native or imported soil, and in high tunnels or hoop houses.

Picture taken at Whitelock Community Farm, Baltimore, MD by Neith Little, UMD Extension.



*Figure 4: Basil grown hydroponically in a modified shipping container at Urban Pastoral in Baltimore, MD.*

*Photo by Neith Little, UMD Extension.*

Urban agriculture encompasses a spectrum of business structures (Figure 6). A large grey area exists between gardening and farming. For example, “market gardening” is a term for a type of small-scale, market-oriented operation, growing a diverse variety of vegetables and fruit on small plots for direct marketing to local customers. Some community gardens are experimenting with Community Supported Agriculture (CSA) subscription programs. CSA community members can access food either by the sweat-equity method of working in the garden (commonly called a “work share”) or by the market-based method of buying into the garden (a paid farm share).

Urban agriculture producers use a variety of words to describe themselves and the work they do. Some growers in urban areas introduce themselves with the title “Farmer” before their name, saying they want to show young people in their communities what a farmer can look like. Other growers describe themselves as gardeners while selling their produce at a roadside stand or farmers’ market. Some CEA growers consider themselves farmers, while others introduce themselves as entrepreneurs or agri-technology innovators.

### **Urban Agriculture Encompasses a Broad Spectrum of Production Methods and Business Models**

Production systems can be broadly categorized as:

- Ground-based outdoor urban gardens and farms (Figure 3);
- Controlled Environment Agriculture (CEA), including greenhouse, hydroponic, and aquaponic indoor production methods (Figure 4);
- Rooftop gardens and farms (which can be open-air or in a CEA greenhouse) (Figure 5);
- Landscaping and nursery businesses;
- Urban livestock.

In Maryland, the majority of self-identified urban farmers produce vegetables, fruit, and cut flowers, either outdoors or in high tunnels. Less than 25% of urban farmers in a 2019 survey in Maryland used hydroponic, aquaponic, or rooftop growing methods (Little et al. 2019a).



*Figure 5: Okra growing on a retrofitted green roof at Up Top Acres in Washington, DC. Rooftop farming can be outdoors, as in this example, or in a greenhouse (controlled environment agriculture).*

*Photo by Neith Little, UMD Extension.*



*Figure 6: Urban agriculture includes activities undertaken for a wide variety of reasons, from home gardens growing vegetables for a family to communal gardens where the harvest is shared among the gardeners to urban farms launched by entrepreneurs, and everything in between.*

*Figure developed by Neith Little, graphic design by Susan Barnes.*



*Figure 7: Whitelock Community Farm, in Baltimore, MD is an example of a not-for-profit farm with a mission of providing affordable food for community members, creating a beautiful and inclusive community space, and caring for the environment.*

*Photo by Lena McBean, © UMD AGNR Image Database.*



**Figure 8: The Greener Garden Urban Farm is an example of a for-profit family farm. Farmers Warren and Lavette Blue also value being able to provide fresh local produce in their community and bring youth to visit the farm to see how food is grown.**

*Photo by Edwin Remsberg, © UMD AGNR Image Database.*

Government agencies and academics often differentiate between gardening and farming, based on whether money changes hands. USDA defines a farm as “any place that produced or sold—or normally would have produced or sold—at least \$1,000 of agricultural products in a given year” (Hoppe and MacDonald 2013). This differentiation matters because as soon as a product is sold for money or a person is paid to do work, additional regulations, taxes, and liability begin to apply to an urban farm.

Urban farms can be organized as either for-profit or not-for-profit entities. Since profit is defined as income minus expenses, a not-for-profit entity might call this “net income” instead of “profit.” A for-profit business pays taxes on this profit and can use remaining profit to reinvest in the business

or they can distribute it to the business owner and/or shareholders. A not-for-profit business does not pay taxes on net income, but is required to reinvest any net income back in the business. For more discussion on urban farm finances, see chapter 2 of *From Surviving to Thriving: Strategies for Urban Farm Success* (Little et al. 2019b).

Whether organized as not-for-profit or for-profit businesses, most urban farms include benefiting their communities among their goals. In a 2018 survey, Maryland urban farmers were asked to choose their top two goals from a list of options. These urban farmers’ top two choices were “to provide food for my community” and “to earn a living.” The third most popular choice was “other,” with a wide variety of write-in responses related to financial, environmental, and social goals (Little et al. 2019a). For example, urban farms might focus primarily on producing healthy and affordable food for their community, on educating community members on how to grow their own food, on employing community members who face barriers to employment, or on providing environmental services such as cooling urban heat islands and growing pollinator habitat.

Urban farms often use a “sliding scale” business model, selling high-value crops to customers who can afford them, such as chefs and farmers market customers in high-income neighborhoods, to subsidize selling produce at affordable prices to their neighbors. For example, Soul Fire Farm in Troy, NY (Lennon et al. 2018) markets their produce via a sliding-scale CSA based on their customers’ self-reported income.

Urban agriculture can be economically important to the grower, whether by producing food for personal use, creating supplemental income through a “micro-enterprise,” or enabling urban residents to start businesses and become entrepreneurs.

Many market-oriented urban farms “direct-market” what they produce; that is, they sell directly to their customers through farm-stands, farmers’ markets, CSAs, and direct sales to restaurants and institutional customers.

Economies of scale and proximity to customers means that selling to wholesale distributors is less economically viable for small-scale urban farms than direct-marketing produce to urban customers. Larger-scale urban farms, such as large hydroponic CEA operations, are more likely to sell their produce wholesale to grocery stores and institutions like university or hospital cafeterias.

### Conclusion

Urban agriculture is broadly and inclusively defined. It includes people who use a wide variety of methods to produce food and other agricultural products in high-population areas for personal use, for sale, and for community benefit.

While there is no consensus on the definition of urban *farming*, many government entities and other organizations use the threshold of \$1,000 in annual sales before expenses. This sales-based definition still includes a wide variety of production practices and marketing tactics which growers adopt to achieve multiple financial, community, and environmental goals.

### Literature Cited

Cromartie, J., & Parker, T. (2018). *What is Rural?* Retrieved from <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural.aspx>

Diekmann, L., Dawson, J., Kowalski, J., Raison, B., Ostrom, M., Bennaton, R., & Fisk, C. (2016). *Preliminary Results: Survey of Extension's Role in Urban Agriculture*, (August), 1–15.

Donovan, S. (2015). *Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance on Uses of the Delineations of these Areas*. U.S. Office of Management and Budget Bulletin No. 15-01.

FAO. (2016). *Urban Agriculture*. Retrieved from <http://www.fao.org/urban-agriculture/en/>

Heimlich, R.E., & Anderson, W.D. (2001). *Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land*. Agricultural Economic Report No. 803, (803), 1–88. <https://www.ers.usda.gov/publications/pub-details/?pubid=41364> Hendrickson, M.K., & Porth, M. (2012). *Urban Agriculture—Best Practices and Possibilities*. University of Missouri Extension, (June), 1–52.

Hoppe, R.A., & MacDonald, J.M. (2013). Updating the ERS Farm Typology. In Economic Information Bulletin No. EIB-110. <https://doi.org/10.2139/ssrn.2267293>

John, P.L.C., & Reynnalls, L. (2016). *What is Rural?* Retrieved December 10, 2018, from <https://www.nal.usda.gov/ric/what-is-rural>

Little, N.G., McCoy, T., Wang, C., & Dill, S.P. (2019a). Results of a needs assessment of urban farmers in Maryland. *Journal of the National Association of County Agricultural Agents*, 12(1), 1–8. <https://www.nacaa.com/journal/index.php?jid=971>

Little, N., Lynch, K.R., Johnson, D., Cook, N., & Myers, G. (2019b). From Surviving to Thriving: Strategies for Urban Farm Success (N. Little (ed.)). University of Maryland Extension. <https://cityfarmer.info/from-surviving-to-thriving-strategies-for-urban-farm-success/>

Oberholtzer, L., Dimitri, C., & Pressman, A.A. (2014). Urban agriculture in the United States: Characteristics, challenges, and technical assistance needs. *Journal of Extension*, 52(6), #6FEA1. Retrieved from <https://archives.joe.org/joe/2014december/a1.php>

Lennon, M., Regan, B., & Penniman, L. (2018). Sowing the seeds of food justice: A guide for farmers who want to supply low-income communities while maintaining financial sustainability.

Ratcliffe, M., Burd, C., Holder, K., & Fields, A. (2016). *Defining Rural at the U.S. Census Bureau: American Community Survey and Geography Brief*. U.S. Census, (December), 1–8. [https://www2.census.gov/geo/pdfs/reference/ua/Defining\\_Rural.pdf](https://www2.census.gov/geo/pdfs/reference/ua/Defining_Rural.pdf)

Santo, R., Palmer, A., & Kim, B. (2016). *Vacant Lots to Vibrant Plots: A Review of the Benefits and Limitations of Urban Agriculture*, (May), Retrieved from [http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/\\_pdf/research/clf\\_reports/urban-ag-literature-review.pdf](http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/_pdf/research/clf_reports/urban-ag-literature-review.pdf)

USDA. (2016). *Urban Agriculture Tool Kit*. Wagstaff, R.K., & Wortman, S.E. (2013). *Crop physiological response across the Chicago metropolitan region: Developing recommendations for urban and peri-urban farmers in the North Central US. Renewable Agriculture and Food Systems*, 30(x), 1–7. <https://doi.org/10.1017/S174217051300046X>

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# RESULTS OF A NEEDS ASSESSMENT OF URBAN FARMERS IN MARYLAND

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## ABSTRACT

University of Maryland Extension conducted a needs assessment of Maryland urban farmers. Twenty-nine urban farmers completed a survey, which represents a large proportion of the urban farming population in this region. The majority of urban farmer respondents grew vegetables, fruits, and cut flowers in land-based production systems using raised-beds, in-ground growing, and high tunnels. Urban farmers prioritized balancing numerous goals, including producing food for themselves and their communities, creating jobs, and providing income for themselves. Financially, urban farmers were similar to the general farming population, with about half of respondents farming part-time and selling less than \$10,000 of farm products. Extension educators with experience working with small-scale, diversified direct-market growers have knowledge and educational programs that can be relevant to urban farmers.

## INTRODUCTION

### Why this needs assessment?

Interest is high in urban agriculture, with many non-profits, businesses, municipalities, and individuals launching urban agriculture ventures. A Google News search of the terms "urban farming" and "urban agriculture" yielded 44,500 and 7,640,000 results, respectively.

Land grant institutions, including University of Maryland, University of the District of Columbia, Cornell University, Pennsylvania State University, and University of Nebraska, have appointed extension educators specifically to develop programming for the urban agriculture audience.

With so much excitement and interest in the topic of urban farming, it is important to base extension outreach on research-based information. This paper presents a needs assessment conducted in Maryland, to better inform urban agriculture Extension program development.

### What is urban agriculture?

Urban agriculture has been most concisely defined by Wagstaff and Wortman (2013) as "all forms of agricultural production (food and non-food products) occurring within or around cities."

Government agencies and the peer-reviewed literature have reached consensus on this broad definition of urban agriculture, which includes all production in or near cities of plants or animals, whether for personal use or for sale, whether soil-based or hydroponic (Diekmann et al., 2016; FAO, 2016; Hendrickson and Porth, 2012; Oberholtzer et al., 2014; USDA, 2016).

Agricultural production near cities is further defined as peri-urban agriculture (Diekmann et al., 2016; Hendrickson and Porth, 2012; Oberholtzer et al., 2014).

## LITERATURE REVIEW

Many previous studies have surveyed the existence and extent of urban agriculture (Smit et al., 2001; Heimlich and Barnard, 1992; Hendrickson and Porth, 2012; Rogus and Dimitri, 2015; Young et al., 2018; Taylor and Lovell, 2012) and the impacts of urban agriculture (Drakakis-Smith et al., 1995; Brown and Jameton 2016). There has been one published study of how Extension is currently addressing urban agriculture (Diekmann et al. 2016).

Two national-level studies have assessed the needs of urban growers (Oberholtzer et al., 2014; Kaufman and Bailkey, 2000). At the local level, needs assessments that surveyed urban agriculture communities include California (Reynolds, 2011; Surfs et al., 2014), New York City (Cohen and Reynolds, 2014), Chicago (Taylor and Lovell, 2014), Kansas (Harms et al., 2013), and Wisconsin (Pfeiffer et al., 2014).

These studies have found that individuals and organizations engage in urban agriculture for many reasons: to improve their own health and economic situation, to improve food access in their communities, to create income and jobs, to beautify their communities, to educate about gardening and farming, to create a feeling of community, and to provide ecosystem services for their communities.

This study focuses on the goals and barriers to success of urban farmers, defined here as someone in an urban area who produces agricultural products for sale, in the Maryland area. Results are compared to both the 2014 national survey of urban farmers, and the 2012 census of the general farming population.

## METHODS

A research team at University of Maryland Extension (UME) conducted a needs assessment of urban farmers in the Maryland region.

### Preliminary field work

From July 2016 through October 2017, we visited 31 urban farms and 3 peri-urban farms in and near Baltimore, MD. We used an emergent design flexibility approach (Patton, 2015), asking the farmers about their goals, perceived barriers, production methods, and experience with Extension. Based on these conversations, we developed a list of questions and hypothetical trends to test using formal needs assessment instruments and a purposeful sampling method.

### Survey and formal interviews

To test the research questions, in 2018 we conducted an electronic survey and formal interviews. The survey was conducted electronically, using Qualtrics® software. The interviews were conducted either over the phone or in person. The University of Maryland, College Park Institutional Review Board reviewed and approved the survey and interview methods, under project number 1013685-1.

The purpose of the survey was to gather quantitative and qualitative data from as many Maryland region urban farmers as possible. The purpose of the interviews were to gather qualitative data from a smaller number of key informants.

Because no complete list of urban farmers exists, survey and interview participation was solicited from two sample populations: (1) a list of 47 urban farmers identified during the preliminary field work and (2) the mailing list of 473 subscribers to Urban Ag E-News, published by UME. As an incentive, participants had the option to enter into a raffle for a \$50 gift card to a seed company.

The first question on the survey asked respondents to identify themselves as either an urban farmer, a peri-urban farmer (near but not in a city), someone who wants to be an urban farmer, a gardener or homesteader, an entrepreneur, a government or non-profit employee (not primarily a farmer), or other. The survey used skip logic to display business-related subsequent questions (such as gross sales) only to those who self-identified as farmer or entrepreneurs.

### Analysis

Because the population of urban farmers is small, Fishers' Exact Test was used to compare this study's responses to those of the USDA Census of Agriculture and the prior national survey of urban farmers (Oberholtzer et al., 2014). The software JMP® was used.

## RESULTS AND DISCUSSION

### Sample size

A survey link was emailed to a list of 47 known urban farmers, 15 of whom responded to the survey. A separate email link, to an identical survey, was emailed to an urban agriculture e-newsletter mailing list of 473 public subscribers, 69 of whom responded. Of those 69 respondents, 12 self-identified as urban farmers and 2 as entrepreneurs. The results from the 15 respondents known to be urban farmers and the 14 respondents who self-identified as urban farmers or entrepreneurs, were combined resulting in a total sample size of 29.

This needs assessment was not a census, which makes definitive counts of urban farmers impossible. However, through more than two years of outreach to the Maryland urban farming community, 42 urban farmers in Maryland and 5 in the District of Columbia have been identified. Thus, although the sample size of the needs assessment survey is small, it represents a large percentage of the urban farming population.

Survey respondents were free to decide whether or not to respond to each question. The sample size for specific questions is listed in parentheses below. We also conducted four interviews. Results from those interviews are reported as quotes to contextualize the survey responses.

### Who is the urban farming population?

*Hypothesis: a higher proportion of urban farmers come from historically underserved communities than in the general farming population (n=27).*

Compared to the 2012 USDA census of farmers in Maryland (USDA-NASS, 2012), a significantly higher proportion of respondents to this survey of urban farmers identified as female (Fishers' Exact Test,  $P < 0.05$ ) or black (Fishers' Exact test  $P < 0.05$ ) (Table 1). According to the census of agriculture, farmers in Maryland in 2012 were 81% male and 19% female, but urban farmers who responded to our survey were more equally split, with 52% identifying as male and 48% as female. In the 2012 Census of Agriculture, 98% of Maryland farmers identified as white, with no other category higher than 1%. In our survey of urban farmers, no one racial or ethnic group comprised a majority of respondents, with white (41%) and black (37%) being the two most common responses.

These results make it especially important that land-grant institutions and Extension programs work to serve urban farmers, because this population includes a high proportion of farmers from historically underserved communities.

**Table 1.** Responses to questions about sex and race/ethnicity from the 2012 Maryland USDA Census of Agriculture and this urban agriculture survey.

Demographic	USDA Maryland Census of Ag (2012)		This urban agriculture survey (n=27)		Difference Percent
	Percent	Count	Percent	Count	
Male	81%	9960	52%	14	-29%
Female	19%	2296	48%	13	29%
White	98%	18617	41%	11	-57%
Black	1%	220	37%	10	36%
≥2 races	NR	NR	15%	4	
Asian	1%	182	7%	2	6%

Hispanic /Latino	1%	211	0%	0	-1%
American Indian	1%	111	0%	0	-1%
Native Hawaiian	0%	0	0%	0	0%

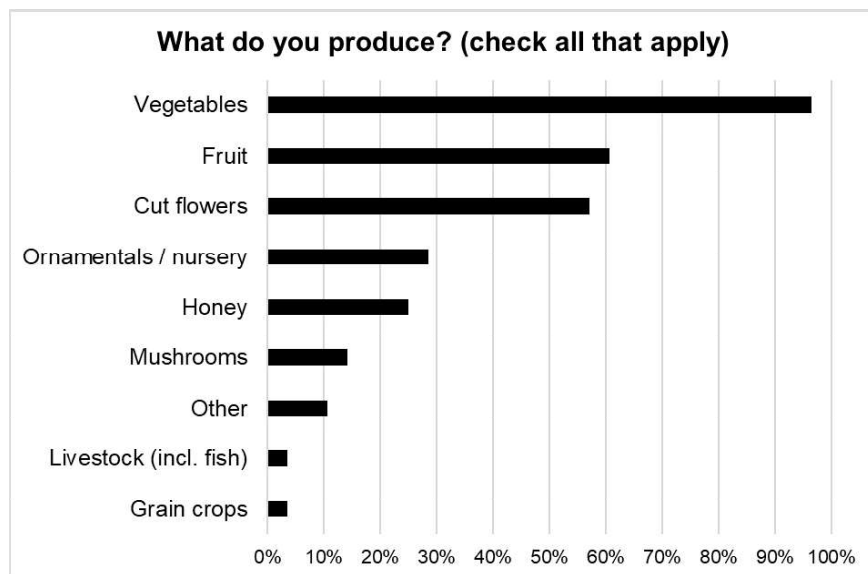
*Hypothesis: Urban farmers bring non-traditional education and experience to farming (n=27).*

Respondents were highly educated: 30% had some college, 37% had graduated college, and 26% had a graduate degree. Respondents reported a wide variety of major study in school, with the most common being the life/physical sciences, agricultural science, business, and the humanities. Similarly, respondents reported a wide variety of professional experience in addition to farming, with the most common being food service, landscaping/nursery production, teaching, business management or accounting, and sales. These results emphasize that urban farmers bring valuable knowledge and skills to their work, and that their foundation of knowledge may not include all the agricultural science and business concepts that traditional Extension programs might expect.

**What production methods do urban farmers use?**

*Hypothesis: most urban farms produce vegetables (n=28).*

The majority of respondents produced vegetables, fruit, and cut flowers (Figure 1).

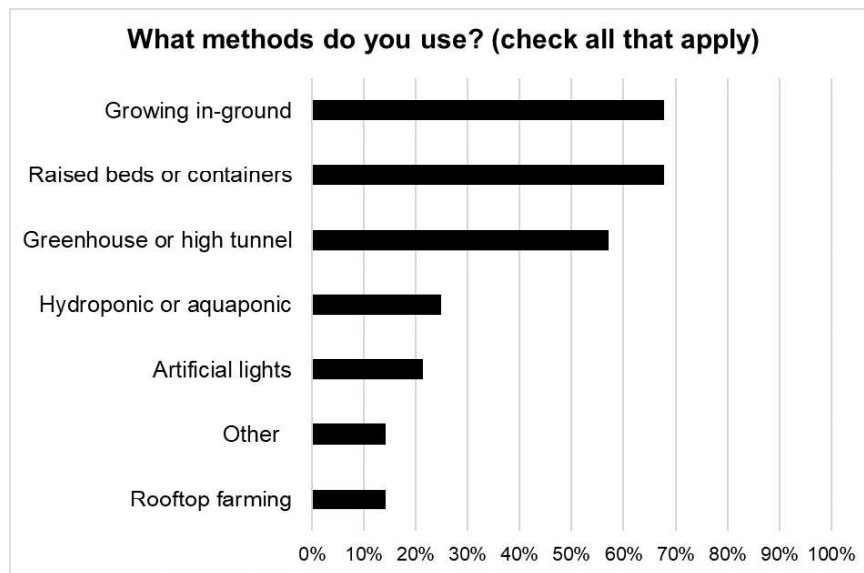


**Figure 1.** Most urban farmers who responded to this survey produce vegetables, fruit, and cut flowers. For this question, n = 28.

*Hypothesis: Most urban farms are land-based, with a small percentage of high-tech hydroponic/aquaponics/vertical farms (n=28).*

When asked to choose all that apply from a list of production methods, the majority of respondents reported growing in raised beds or containers (68%), in-ground (68%), and in greenhouses or high tunnels (57%) (Figure 2). A minority of respondents use hydroponics/aquaponics (25%), artificial or supplemental lights (21%), or rooftop farming (14%).

High-tech urban agriculture methods tend to get a lot of press, but the high proportion of urban farms growing in-ground and in raised beds means that Extension research and education for urban agriculture will need to be inclusive of low-tech production methods. Because the majority of urban farmers are ground-based and produce vegetables, fruits, and cut flowers, it may help Extension educators to think of urban farmers as a subset of small-scale, diversified, direct-market vegetable producers.



**Figure 2.** Most urban farmers who responded to this survey used ground-based growing methods such as growing in raised beds, in-ground, and in greenhouses or high tunnels (n=28).



**Figure 3.** Examples of land-based urban farming methods (raised bed, in-ground, and high-tunnel), at Whitelock Community Farm in Baltimore, MD. Photo by Neith Little, UMD Extension.



**Figure 4.** Examples of aquaponics production of leafy greens using both natural and supplemental artificial light at Envista Farms at Southern Friendship Missionary Baptist Church, in Temple Hills, MD. Photo by Neith Little, UMD Extension.

#### What are the goals of urban farmers?

*Hypothesis: Urban farmers strive to balance numerous goals, including producing food for themselves and their communities, creating jobs, and providing income for themselves (n =28).*

Options for this question were formulated based on informal conversations with urban farmers. When forced to choose only two of these goals, the most popular choices were to provide food for their communities (50%) and to earn a living (46%).

However, "other" was a close third (32%). Of the respondents who chose "other" as one of their top two goals, 2 used the write-in option to list more three goals instead of two. Other write-in responses were different from the provided goal options, such as "to protect farmland from development," "to beautify and build

community,” and “to combat societal ills that plague our urban communities.”

These responses illustrate how dedicated many urban farmers are to community benefit through their work. Interestingly, three interview participants framed their primary goals as community building and food access and described financial sustainability as a means to achieving those goals, or lack of finances as a barrier to achieving their goals.

The economic realities of small-scale production can create a great deal of tension due to the dual goals of producing affordable food for the farmers’ communities and producing income for the farmers and farmworkers. While food access and food justice were important goals for many urban farmers, the additional goals of income generation, economic empowerment, and workforce development were also important because they are necessary for community development and community empowerment. The challenge of balancing these goals, and a case study of how one urban farm is working to overcome it, was described well in a recent Northeast SARE report by Lennon et al. (2018).

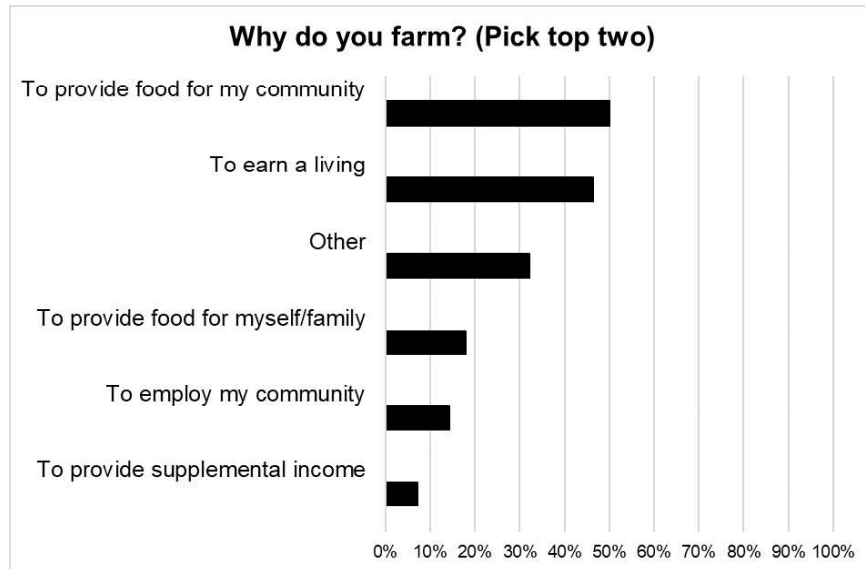


Figure 5. Urban farmers have many goals for their work, including both generating income and feeding their communities (n=28).

**What do urban farmers see as the biggest barriers to achieving their goals?**

This question was asked first as a qualitative, open-ended question, and then as a quantitative forced choice question (Figure 6, n=27).

Qualitative responses predicted many of the categories later displayed in the quantitative question. Other qualitative responses zeroed in on the tension between urban farmers’ goals described above, for example “finding a price point that is attainable for the community, while being able to provide a good quality of life for our employees.” Other barriers identified included water access and local policies and bureaucracy.

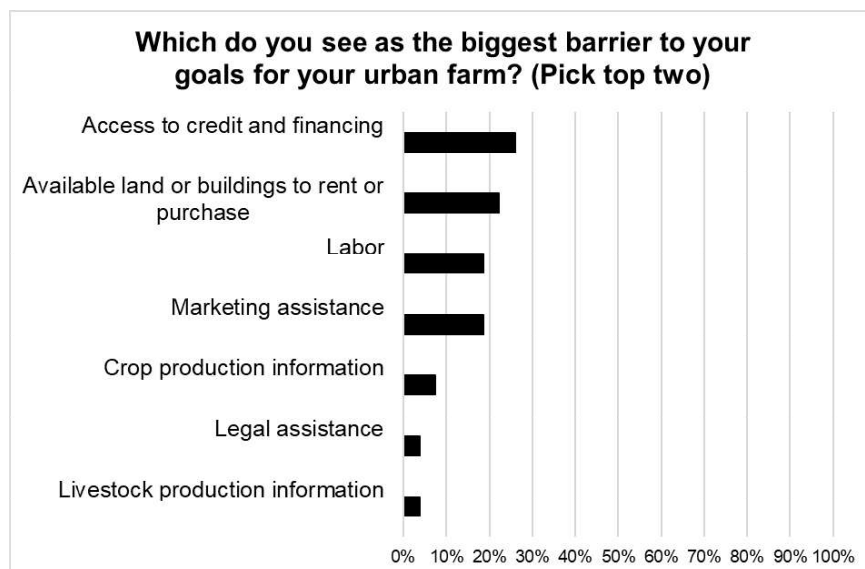


Figure 6. Access to financing and land availability were the most commonly identified barriers to urban farmers’ goals (n=27).

### How does the income of Maryland urban farmers compare to other farmers?

Categories for gross sales were chosen to be comparable with the previous national survey of urban farmers conducted by Oberholtzer et al. (2014). Compared to Oberholtzer's results, the survey of Maryland urban farmers found a similar distribution of income, with over 50% of respondents reporting gross sales of less than \$10,000.

**Table 2.** Urban farmers' gross sales were similar in this study, compared to a 2014 national survey of urban farmers. Among the farming population in general, the 2012 USDA Census of Agriculture also found that 57% of US farmers sold less than \$10,000 gross.

Oberholzer et al. 2014			This survey of urban farmers		
Category	Percent	Count	Category	Percent	Count
Less than \$10,000	49%	119	Less than \$2,499	45%	10
			\$2,500 to \$9,999	9%	2
\$10,000-\$24,999	22%	54	\$10,000 to \$24,999	5%	1
\$25,000-\$49,999	10%	25	\$25,000 - \$49,999	14%	3
\$50,000-\$99,999	7%	17	\$50,000 to \$99,999	5%	1
\$100,000-249,999	7%	18			
\$250,000-\$499,999	2%	5	\$100,000 to \$999,999	18%	4
\$500,000-\$999,999	0%	1			
\$1 million or more	2%	4	\$1 million or more	5%	1

Looking back to the goals that respondents identified for their urban farms, all of the respondents who did not identify an income related goal (make a living, supplemental income, employ people) as one of their top two goals also reported gross sales of less than \$2,499. This underscores that for some urban farmers, income generation is a means to an end, rather than the goal itself. Additionally, these sales numbers are consistent with the general United States farming population. The 2012 Census of Agriculture found that 57% of the 2.1 million farms in the US sold less than \$10,000 in agricultural products (USDA-NASS, 2014), similar to the 54% of the urban farmers in this survey and 49% of the urban farmers in Oberholzer's 2014 study who sold less than \$10,000 gross.

Urban farmers are also similar to the general farming population in their use of off-farm income. Forty-seven percent of urban farmer respondents to this survey reported farming part-time, while in the 2012 Census of Agriculture, 61% of US farmers reported working some days off the farm, and 52% reported having a primary occupation other than farming (USDA-NASS, 2014).

## CONCLUSIONS

### How can Extension better serve urban farmers?

Extension has a long history of serving the farming community (Rasmussen, 1989). The needs assessment result that a higher proportion of urban farmers come from historically underserved communities than is true of the general farming population emphasizes how important it is for Extension to similarly support the emerging community of urban farmers.

Extension educators can be heartened to know that they do have a lot to offer urban farmers. The majority of urban farmers in this study grow using methods that will be familiar to those who have worked with other small-scale, diversified, direct-market growers. It is important to increase the amount of research-based information on high-tech urban farming methods such as aquaponics, hydroponics, and rooftop farming. However a high proportion of urban farmers can be served by adapting existing programming on diversified vegetable production. In this survey, topics such as high-tunnel management, recordkeeping, specialty crop production, farm financial management, and sustainable pest management were highly prioritized by urban farmers, and many strong Extension programs on these topics already exist.

To customize existing Extension educational programs for urban farming audiences, it will be important to consider urban farmers' goals, demographics, educational background, farming practices, and scale of production. For example, consider how financial education could be tailored to an urban farmer's goals. Just as some rural farmers might see farm income as a means to preserve the legacy of a family farm, some urban farmers might think of improving their financial sustainability as a means to achieving the other goals they have for their farms of feeding, empowering, educating, and beautifying their communities. Framing financial sustainability in these terms could motivate participants to invest time in learning and applying what they learn. Additionally, what financial success looks like will differ depending on a farmer's goals. Farmers who prioritize affordable healthy food access might need to pursue different pricing and marketing strategies than farmers who choose to prioritize job creation and economic empowerment of community residents.

By adapting existing Extension programs in response to urban farmer goals and production methods, Extension can support urban farmers in both creating income for themselves and their employees and also benefitting their communities.

## LITERATURE CITED

- Brown, K. H., and Jameton, A. L. (2016).** Public health implications of urban agriculture. *Journal of Public Health Policy*, 21(1):20–39.
- Cohen, N., and Reynolds, K. (2014).** Resource needs for a socially just and sustainable urban agriculture system: Lessons from New York City. *Renewable Agriculture and Food Systems* 30(1):1–12. <https://doi.org/10.1017/S1742170514000210>
- Diekmann, L., Dawson, J., Kowalski, J., Raison, B., Ostrom, M., Bennaton, R., and Fisk, C. (2016).** Preliminary results: Survey of Extension's role in urban agriculture. eXtension Community of Practice: Community, Local, and Regional Food Systems. Retrieved from <https://foodsystems.extension.org/2019/03/survey-of-extensions-role-in-urban-agriculture-results/>
- Drakakis-Smith, D., Bowyer-Bower, T., and Tevera, D. (1995).** Urban poverty and urban agriculture: An overview of the linkages in Harare. *Habitat International* 19(2):183–193. [https://doi.org/10.1016/0197-3975\(94\)00065-A](https://doi.org/10.1016/0197-3975(94)00065-A)
- FAO. (2016).** Urban Agriculture. Retrieved from <http://www.fao.org/urban-agriculture/en/>
- Harms, A. M. R., Presley, D. R., Hettiarachchi, G. M., and Thien, S. J. (2013).** Assessing the educational needs of urban gardeners and farmers on the subject of soil contamination. *Journal of Extension* 51(1), 1FEA10.
- Heimlich, R. E., and Barnard, C. H. (1992).** Agricultural adaptation to urbanization: Farm types in northeast metropolitan areas. *Northeastern Journal of Agricultural and Resource Economics*, 21(1):50–60.
- Hendrickson, M. K., and Porth, M. (2012).** Urban Agriculture — Best Practices and Possibilities. University of Missouri Extension Report. Retrieved from: [http://extension.missouri.edu/foodsystems/documents/urbanagreport\\_072012.pdf](http://extension.missouri.edu/foodsystems/documents/urbanagreport_072012.pdf)
- Kaufman, J., and Bailkey, M. (2000).** Farming Inside Cities : Entrepreneurial Urban Agriculture in the United States. Lincoln Institute of Land Policy Working Paper. Retrieved from <http://www.urbanlith.org/wp-content/uploads/2008/10/farminginsidecities.pdf>
- Lennon, M., Regan, B., and Penniman, L. (2018).** Sowing the seeds of food justice: A guide for farmers who want to supply low-income communities while maintaining financial sustainability. Sustainable Agriculture Research and Education manual. Retrieved from <https://projects.sare.org/information-product/sowing-the-seeds-of-justice-food-manual/>
- Oberholtzer, L., Dimitri, C., and Pressman, A. A. (2014).** Urban agriculture in the United States: Characteristics, challenges, and technical assistance needs. *Journal of Extension*, 52(6), #6FEA1. Retrieved from <http://www.scopus.com/inward/record.url?eid=2-s2.0-84922015476&partnerID=tZOtx3y1>
- Patton, M. Q. (2015).** *Qualitative Research and Evaluation Methods* (4th ed.). Washington, DC: Sage.
- Pfeiffer, A., Silva, E., and Colquhoun, J. (2014).** Innovation in urban agricultural practices: Responding to diverse production environments. *Renewable Agriculture and Food Systems*, 30(1):79–91. <https://doi.org/10.1017/S1742170513000537>
- Rasmussen, W. (1989).** *Taking the university to the people: Seventy-five years of cooperative Extension* (First Edit). Ames, Iowa: Iowa State University Press.
- Reynolds, K. (2011).** Expanding technical assistance for urban agriculture: best practices for extension services in California and beyond. *Journal of Agriculture, Food Systems, and Community Development* 1(3):197-216.
- Rogus, S., and Dimitri, C. (2015).** Agriculture in urban and peri-urban areas in the United States: Highlights from the Census of Agriculture. *Renewable Agriculture and Food Systems* 30(1), 64–78. <https://doi.org/http://dx.doi.org/10.1017/S1742170514000040>
- Smit, J., Nasr, J., and Ratta, A. (2001).** Urban agriculture: food, jobs, and sustainable cities. The Urban Agriculture Network. Retrieved from <http://jacsmi.com/book.html>
- Surls, R., Feenstra, G., Golden, S., Galt, R., Hardesty, S., Napawan, C., and Wilen, C. (2014).** Gearing up to support urban farming in California: Preliminary results of a needs assessment. *Renewable Agriculture and Food Systems*, 30(1):1–10. <https://doi.org/10.1017/S1742170514000052>
- Taylor, J. R., and Lovell, S. T. (2012).** Mapping public and private spaces of urban agriculture in Chicago through the analysis of high-resolution aerial images in Google Earth. *Landscape and Urban Planning* 108(1):57–70. <https://doi.org/10.1016/j.landurbplan.2012.08.001>
- Taylor, J. R., & Lovell, S. T. (2014).** Urban home gardens in the Global North: A mixed methods study of ethnic and migrant home gardens in Chicago, IL. *Renewable Agriculture and Food Systems* 30(01):22–32. <https://doi.org/10.1017/S1742170514000180>
- USDA-NASS. (2012).** Census of Agriculture State Data: Maryland Selected Operator Characteristics.
- USDA-NASS. (2014).** 2012 Census of Agriculture highlights: Farm demographics, (800), 1–4. Retrieved from [https://www.agcensus.usda.gov/Publications/2012/Online\\_Resources/Highlights/Farm\\_Demographics/Highlights\\_Farm\\_Demographics.pdf](https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Farm_Demographics/Highlights_Farm_Demographics.pdf)
- USDA. (2016).** Urban Agriculture Tool Kit. United States Department of Agriculture Publication. Retrieved from <https://www.usda.gov/sites/default/files/documents/urban-agriculture-toolkit.pdf>
- Wagstaff, R. K., and Wortman, S. E. (2013).** Crop physiological response across the Chicago metropolitan region: Developing recommendations for urban and peri-urban farmers in the North Central US. *Renewable Agriculture and Food Systems* 30(1), 1–7. <https://doi.org/10.1017/S174217051300046X>
- Young, L. J., Hyman, M., and Rater, B. (2018).** Exploring a Big Data Approach to Building a List Frame for Urban Agriculture: A Pilot Study in the City of Baltimore. *Journal of Official Statistics* 34(2):323-340. Retrieved from: <https://content.sciendo.com/view/journals/jos/34/2/article-p323.xml>

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