

cambridge.org/raf

Research Paper

Cite this article: Campbell CG, DeLong AN, Diaz JM (2023). Commercial urban agriculture in Florida: a qualitative needs assessment. *Renewable Agriculture and Food Systems* **38**, e4, 1–8. <https://doi.org/10.1017/S1742170522000370>




Received: 7 February 2022
Revised: 16 July 2022
Accepted: 1 November 2022

Key words:

Food policy; local food production; needs assessment; qualitative research; urban agriculture

Author for correspondence:

Catherine G. Campbell,
E-mail: cgcampbell@ufl.edu

Catherine G. Campbell¹ , Alia N. DeLong²  and John M. Diaz³ 

¹Department of Family Youth and Community Sciences, Institute of Food and Agricultural Sciences, University of Florida, PO Box 110310, Gainesville, FL 32611-0310, USA; ²Mid-Florida Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida, 2725 S Binion Rd, Apopka, FL 32703-8504, USA and ³Department of Agricultural Education and Communication, Institute of Food and Agricultural Sciences, University of Florida, 1200 North Park Rd, Plant City, FL 33563-1540, USA

Abstract

The global trend of urbanization coupled with an increasing awareness of the importance of food systems resilience, has led to an increasing interest in urban agriculture to sustainably feed the rapidly growing urban population and mitigate against food supply chain disruptions. While home and community gardens have been long studied, there has been relatively little empirical research focused specifically on commercial urban agriculture (CUA) operations. The purpose of this study was to characterize commercial urban farms, and to identify their primary barriers to business development and expansion, their perceptions of future opportunities, and their specific informational needs. Because CUA has received relatively less attention in previous empirical research, a qualitative approach was used for this needs assessment to collect rich, contextualized information to help differentiate the specific barriers, opportunities and needs of CUA operations as opposed to their rural counterparts. We conducted semi-structured interviews ($n = 29$) of CUA producers in Florida. These interviews revealed that CUA operations face many of the same barriers that are common to establishing and growing small farms, with additional barriers due to local government regulations and tensions associated with farming on land that is not traditionally used for agriculture. Despite these difficulties, CUA operators believe their urban location is a key benefit to their operation and they see a variety of opportunities for future business and market expansion.

Introduction

Urbanization represents a megatrend in global land-use change that can be observed across the world, with 70% of the global population expected to live in cities by 2050 (Koceva *et al.*, 2016; Gerten *et al.*, 2019). The trends of rapid urbanization are particularly salient in the United States (USA), with the continued expansion of regional megalopolis (USDA ERS, 2021). These trends represent a significant challenge for the future of agriculture and have implications on international agriculture priorities.

In the USA, the state of Florida is at the forefront of this issue representing a rapidly urbanizing state with a historically successful agricultural industry. In 2019, Florida was home to 21.5 million residents, up from 18.8 million just a decade before, with an increasing proportion of the population living in urban and peri-urban areas (USDA ERS, 2021). The United States Department of Agriculture (USDA) currently classifies 44 of Florida's 67 counties as urban (USDA Economic Research Service, 2021), and virtually the entire state is in an urban metropolitan or micropolitan statistical area according to the US Census Bureau (2020). This increase in urbanization has led to an increasing interest in the future of commercial urban agriculture (CUA).

Empirical research has found that urban farms differ from their rural counterparts in a variety of ways, including operator demographics, scale of operations, production systems used and choice of sales and market channels (Inwood and Clark, 2013). Unlike some other segments of the agricultural industry, such as nursery growers, cattleman or citrus growers, CUA farms do not have an industry organization specifically focused on their operations and needs. In addition, CUA farms are not necessarily included in the Census of Agriculture. The US Congressional Research Office states that 'given the diversity in the types of urban farming operations, existing data limitations, and lack of consensus about what constitutes an urban or peri-urban farm, USDA does not report data and statistics on the number of urban farming operations in the United States' (Johnson and Cowan, 2019). In addition, USDA acknowledges that their methodology fails to count farms in under-served areas and operated by minority populations (USDA National Agricultural Statistics Service, 2017). The 2018 farm bill directed USDA to conduct a 'follow-up study' to its most recent Census of Agriculture to examine US urban farming operations in 2017, but the US

© The Author(s), 2023. Published by Cambridge University Press. This is an Open Access article, distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike licence (<http://creativecommons.org/licenses/by-nc-sa/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the same Creative Commons licence is used to distribute the re-used or adapted article and the original article is properly cited. The written permission of Cambridge University Press must be obtained prior to any commercial use.

Congress has not appropriated funds for that urban farming census (Johnson and Cowan, 2019). There has been limited social science peer-reviewed research on urban agriculture, with the bulk of research to date having focused on the urban agriculture in California or in large cities in the midwest or the northeast USA (Guitart *et al.*, 2012).

Many studies on the needs of urban farmers and the barriers to business success and expansion in urban areas have been quantitative (Hendrickson and Porth, 2012; Oberholtzer *et al.*, 2014). While those studies are useful, quantitative data cannot entirely provide the rich context that is necessary to fully understand and explain the needs and barriers of CUA operations, particularly given their likely differences from rural farmers and the growing prevalence of CUA as a segment of the agricultural industry. One qualitative study did provide an initial picture of the needs and barriers to urban agriculture (Reynolds, 2011), but it—like many other studies—lumped together the myriad activities that can collectively fall under the umbrella of ‘urban agriculture’—including home gardening, community gardens, school gardens, homesteading and CUA—without differentiating between these distinct activities.

Based on the literature to date, there are recurring themes that have been identified as primary barriers to urban agriculture activities. CUA operations have been found to have issues with profitability, start-up capital, hiring employees, business planning and oversight and securing access to land (Kaufman and Bailkey, 2000; Oberholtzer *et al.*, 2014). CUA farms have issues that are unique to their urban geography, such as issues with farming on a land that is not zoned for agriculture and local governments’ codes of ordinances disallowing farming activities (Reynolds, 2011; Hendrickson and Porth, 2012; Oberholtzer *et al.*, 2014; Horst *et al.*, 2017). The purpose of this research is to provide a rich, qualitative characterization of the barriers, needs and opportunities specifically for CUA.

Materials and methods

Instrumentation, sampling and data collection

The research team developed a pre-interview survey and a semi-structured interview protocol to explore urban farmers’ barriers, opportunities and needs. The questions and answer choices in the pre-interview survey and the semi-structured interview questions were based on the review of literature. The pre-interview survey was used to collect basic farm information—such as size, location, time in operation—as well as farmers’ perceptions of their top three barriers and opportunities. The interview questions focused on urban farmers’ perceptions of the advantages and disadvantages of their urban location, barriers to farm operations, future opportunities for business development or expansion and the types of resources that would have helped them in their start-up process. The interview questions are provided in Table 1.

An expert panel of social scientists who conduct research on food and agriculture reviewed the pre-interview survey and the semi-structured interview protocol for face and content validity, and the instruments were revised based on their feedback. The expert panel consisted of a geographer, a food scientist, an agricultural economist and an agroecologist; each of the panel members conducts research and outreach programs focused agricultural producers in the USA and internationally. Based on the expert panel’s feedback, both the pre-interview survey and the interview protocol were shortened by reducing the total number

Table 1. Urban farmer interview questions

- (1) Tell me about your farming operation. Please discuss the layout of your farm, your most important revenue streams, types of technology you use and your production scale in terms of pounds you produce per year.
- (2) What was the process of starting a farm like for you?
- (3) What factors most influenced your decisions about what market channel(s) you use to sell your products?
- (4) In your initial survey you indicated that [One] and [Two] were your top two barriers or challenges for your farm. How has that challenge affected your farming operation?
- (5) In the survey we sent you, you said that [One] and [Two] are the biggest opportunities for the future. What makes them the biggest opportunities?
- (6) What are the advantages of being located in an urban area?
- (7) What are the disadvantages of being located in an urban area?

of questions and several interview questions were reworded. The team then conducted cognitive interviews of members of the target population to assess the face validity of the revised questions and to ensure the questions were understood by the target population in the way the research team intended. Based on the cognitive interviews, several questions were reworded to be more specific.

Researchers identified 71 farmers via a referral sample, as is recommended for hard-to-reach populations (Goodman, 2011). Our initial referrals were from 17 University of Florida, Institute of Food and Agricultural Sciences Extension faculty who work with urban farmers. At the end of each interview, farmers were asked to recommend other potential interviewees. To be included in the study, a farm needed to be operating a CUA farm in a major metropolitan area in Florida as defined by the US Office of Management and Budget. In total, the research team conducted semi-structured interviews with 29 urban farmers in Florida from November 2020 through March 2021. All but two interviews were conducted on Zoom video conferencing software (Zoom Video Communications, Inc., 2020). Two interviews were conducted in person, consistent with University of Florida COVID-19 protocols. Interviews were between 27 and 89 min long, with the average length being 54 min. During the interview, interviewees gave in-depth explanations of their pre-interview survey answer choices. All interviews were recorded and transcribed verbatim. CUA farmer interviewees came from all major metropolitan areas of Florida—including Miami, Tampa, Orlando and Jacksonville. The research conducted in this study was approved by University of Florida Institutional Review Board (Study no. IRB202000516).

Data analyses

Researchers exported the pre-interview survey results from Qualtrics (Qualtrics Software, Provo, UT, 2020) and calculated descriptive statistics in Excel. The research team used NVivo qualitative data analysis software (QSR International Pty Ltd., NVivo 12 Plus) to analyze the semi-structured interview transcripts. Interview transcripts were analyzed via thematic analysis (Nowell *et al.*, 2017). The research team conducted two phases of coding using a combination of inductive and deductive approaches (Northcutt and McCoy, 2004). Before analyzing the data, the research team developed a list of the deductive codes that corresponded with this study’s research questions and anticipated responses. The inductive codes were data-driven, or emergent codes, which were not anticipated in advance. Two

members of the research team conducted two cycles of coding. During the first cycle of coding, the coders identified topics that participants discussed through descriptive or topical coding, which describes the coding with descriptive nouns, and they identified participant perspectives using *in vivo* coding, which applies the words participants use verbatim (Charmaz, 2014; Miles *et al.*, 2014; Saldana, 2015). Throughout the first cycle, the coders also employed eclectic coding, which combines the descriptive and *in vivo* coding and is used to refine first-cycle coding decisions (Glaser and Strauss, 1967; Patton, 2015). In the second cycle, the coders conducted analytical pattern coding, which is used to develop meta-codes that identify similarly coded data by grouping them and generate major themes to identify more abstract and general concepts (Miles *et al.*, 2014; Saldana, 2015). A third member of the research team reviewed the analysis to verify the accuracy of the analysis conducted by the first two coders.

Results and discussion

Farm operation characteristics

Ninety percent of the interviewed farmers owned or operated new and beginning farm operations—defined by USDA as being in existence for 10 or fewer years—and close to 60% had been in operation for 5 years or less. The farms were small, with 83% of them operating on a farm of 5 acres or fewer and 41% operating on less than 1 acre. More than half did not own the land they were farming. By comparison, the average size for a Florida farm is 246 acres (USDA National Agricultural Statistics Service, 2020). They primarily farmed in-ground and under protection, with most farms utilizing one or more production methods. For almost all farms, vegetables were one of their top three crops in gross annual sales. The bulk of the CUA farms were taking advantage of their proximity to consumers by selling via direct-to-consumer market channels (see Tables 2 and 3).

Advantages of urban location

All farmers ($n = 29$) said that their urban location was an advantage due to its proximity to their markets, customers, visitors, employees and volunteers. They specifically mentioned the benefits of their location being close to their market ($n = 20$), providing greater opportunity for customers to visit the farm ($n = 13$), and saving time and expense from travel ($n = 12$). For example, one farmer said ‘One cool thing about my farm is that I’m like ... five minutes from Lowe’s and Home Depot.... So anytime I like need to get tools or whatever I can just run over there real quick’. Proximity is also beneficial in maintaining good relationships with customers because it is easy to provide products to customers quickly when necessary. For example, one farmer said, ‘The advantages are simple and straightforward. I am 15 min from a client, so I use the minimum amount of gasoline to get there, and I can respond if someone’s in a jam or someone missed an order. I can respond myself and be there 15 or 20 min. So that really, really helps me out’. Four farmers mentioned exposure of their farm to the public as an advantage—by which they meant that their farm is not *merely* close to the public, but visible to it. For example, one farmer said ‘Just the sheer publicity that you get from having a farm in the city just, you know, having it be so accessible, having it be something around the corner. You know, people stumble onto it; they see it’.

Table 2. Farm characteristics from pre-interview survey

Variable	<i>f</i>	%
Length of time in operation (years)		
Less than 2	9	31.03
3–5	8	27.59
6–10	9	31.03
11–25	2	6.90
More than 25	1	3.45
Farm size (acres)		
Less than 1	12	41.38
1–5	12	41.38
6–10	1	3.45
11–20	2	6.90
More than 20	2	6.90
Land in production (acres)		
Less than 1/2	8	27.6
1/2–1	2	6.9
1–5	11	37.9
6–10	4	13.8
11–20	1	3.4
More than 20	1	3.4
Land access arrangement		
Own	14	48.28
Lease/rent	10	34.48
Other arrangement	5	17.24
Workers employed on farms		
Routine farm tasks	19	65.52
Management/operations	6	20.69
Marketing/sales	6	20.69

A small number of interviewees mentioned that a benefit of their urban location was that it makes it easier to find workers and volunteers because they do not need to travel as far as they would to work at a rural farm ($n = 6$). One farmer discussed that the benefit of proximity for having volunteers goes beyond simply having free labor, but that it helps them to get free publicity:

‘Most people bike out, so we get to have like a very active interface with the community. It’s pretty valuable to us... If someone’s thinking about working ... if they’re kind of weighing the two things—5-minute commute, 45-minute commute—I think that’s a big attraction... that’s a kind of income stream because we get this free labor, you know, then we get all this kind of free publicity, like people leave the farm like talking about it and excited about it and talk about with their friends, so this whole like fan club because that’s what they are. It’s not direct, you know, cash income, but there is this big benefit to the farm’.

Disadvantages of urban location and barriers to business operations and expansion

The pre-interview survey asked the urban farmers to indicate their top three barriers (see Table 4). In the interviews, farmers

Table 3. Farm production and marketing characteristics from pre-interview survey

Variable	<i>f</i>	%
Production method		
In-ground	21	72.41
Protected agriculture, e.g., greenhouse, shadehouse, season extenders	18	62.07
Raised bed	12	41.38
Hydroponics	5	17.24
Aquaponics	2	6.90
Crops grown		
Vegetables	25	86.21
Other1	6	20.69
Fruits	4	13.79
Eggs	2	6.90
Honey	1	3.45
Meat	1	3.45
Cheese	0	0.00
Market outlet		
Farmers' market	19	65.52
Restaurants	16	55.17
CSA members	11	37.93
Wholesale buyers	6	20.69
Farm stand	5	17.24
Other2	5	17.24
Grocery or other stores (direct sales)	4	13.79
U-pick	0	0.00
Farmer cooperative	0	0.00

1Vegetable starts, compost, cut flowers, sugarcane.

2Service industry, online, own market, delivery.

Table 4. Barriers urban farmers face from pre-interview survey

Barrier	<i>f</i>	%
Financial resources	14	48.28
Access to land	12	41.38
Issues with government or regulations, e.g., zoning, allowable activities or acquiring permits	10	34.48
Other1	10	34.48
Competition with land development or other land-uses for your site	9	31.03
Finding labor	8	27.59
Soil contamination	4	13.79
Lack of organization/support from your peer farmers	2	6.90
Access to water	1	3.45
Lack of support or conflicts with surrounding community	1	3.45

1Sales and marketing, climate, time-intensive, emerging diseases.

discussed the barriers facing their farms and the disadvantages of being in an urban location. While we asked the farmers about only their top barriers, they all discussed multiple, intersecting barriers, not only in the barriers portion of the interview, but also in their discussion of other topics.

Financial barriers and disadvantages

Nineteen of 29 farmers discussed financial resources as a barrier. Of the financial barriers, access to start-up capital was the most frequently discussed ($n = 15$). Specifically, farmers had difficulties associated with the inaccessibility of capital because they are ineligible for many grants that are available to rural farmers and banks deny them loans despite good credit ($n = 7$). While previous literature has long documented the financial difficulties of both rural and urban farms, this qualitative finding regarding start-up capital being unavailable for CUA farms provides nuance to the kinds of financial barriers CUA farms face due to their urban location. Those who do get bank loans have needed co-signers or have taken on a lot of debt. One farmer explained that

‘As a small-scale farmer, even with a [good] credit score... I was not able to get any type of financial loans for my farm.... To get this farm up and running, we had to exhaust every bit of our savings’.

Farmers also discussed that not having the financial resources of larger-scale farms was a barrier. Three farmers discussed the fact that they did not have money to pay the up-front costs to make improvements on their farms, purchase needed equipment or diversify their product offerings in order to increase their revenue, one summed up the dilemma with the adage, ‘It costs money to make money’.

Land-related barriers and disadvantages

As was anticipated by the review of literature, more than half ($n = 16$) of farmers discussed zoning or land-use regulations as a top barrier. Zoning is the way that local governments control the kinds of activities that can occur on property under their jurisdiction. Each piece of property or ‘parcel’ has a zoning designation that specifies the activities or structures that are allowed on that parcel. Agricultural activities are allowed on land that is zoned for agriculture without any special approvals or permits. However, land that does not have agriculture as its principal use may require special permits to conduct agricultural activities or to build a structure, such as a shed for a tractor. In our interviews, CUA farmers discussed that their zoning explicitly precluded urban agriculture or did not address agricultural activities at all, which left farmers guessing what activities are allowed ($n = 7$). The overall sentiment was that the zoning and local regulations are frustrating, cumbersome and limiting. Farmers discussed that dealing with local regulations restricts or slows down farm development and expansion. As one farmer said: ‘How do I get around this... dealing with the governmental red tape constantly? ... It feels like a constant uphill battle’. A parallel disadvantage of being in an urban area is acquiring permits. For example,

‘Working in combination with the city, it’s just a different beast. Like you can’t move without someone stopping you—like ‘you can’t build’. It’s just it’s a lot of hindrance, takes a lot longer to do things. It takes a lot more money to do things... when you’re just starting, it’s like, every step you take forward is kind of two steps back’.

Land development (or the threat thereof)—and its attendant impact on land availability and cost—was an omnipresent barrier and disadvantage for CUA operations. Future land-use designations specify general constraints of allowable density and intensity of development in certain areas and provide guidelines on the types of zoning classifications that the land may have in the future. Land development is a key contributor to CUA operations' problems with land access. Thus, even land that has not yet been developed, may be designated by a county or municipality for future development. More than half of the interviewed farmers ($n = 16$) discussed land access as one of their top barriers, and more than a third ($n = 10$) reported disadvantage of the urban environment was the potential for future development. Farmers discussed that competition from land developers drives up land prices, and urban, high-density zoning means lenders favor housing development over agricultural use. One farmer described the issues associated with zoning and land-access as follows:

'Developers are trying to buy the land so it's being valued as residential. It's taken accessibility away from farmers to buy it, you know it's agricultural land. It's been agricultural forever, and now it's zoned residential. Shifting land use makes it inaccessible for farmers'.

Several farmers reported being harassed by land developers to sell their farm because housing on that land would be more profitable. As development increases, there are two primary consequences: (1) expenses increase for the farms because of increases in taxes, for example, and (2) farmers cannot expand their farm because nearby land is either unaffordable or has already been purchased by developers. This confluence of factors is especially tenuous for farmers who do not own their land. Property owners may choose to sell the land to developers, and the farmers growing on that land have no choice in the matter. In other situations, increasing rent could price farmers out of their leases. One farmer put it succinctly: 'The single biggest threat is that your land is worth more not as a farm'.

Barriers and disadvantages with proximity of neighbors

Development and the proximity of neighbors diminish quality of life for farmers and create issues with conducting farm operations. For example, ten farmers discussed different facets of pollution. Noise and light pollution can disrupt the 'peacefulness' enjoyed on a farm and being close to traffic is a main driver of noise pollution. Seven farmers reported that safety and security are a concern for urban farmers. Farming in a dense urban area increases the chance of theft and vandalism as compared with rural farm locations. High-tech operations face more expensive vandalism of systems, whereas in-ground farmers were more concerned with expensive equipment being stolen.

Seven farmers discussed that their neighbors were a disadvantage. Neighbors may complain about smells and sounds that are created by necessary farm activities, which requires that farmers schedule farm activities based on what is least disruptive to their neighbors. The more urban surroundings become, the more scrutiny urban farmers face from neighbors. One farmer described it as follows:

'They're used to HOA [homeowners association] communities and, you know, manicured St. Augustine grass... they still have certain expectations of what they deem nice, what looks nice for the street. So it's like if you know these people will be knocking on your door, one day saying like, "Hey, take care of your swale, your weeds are too high" or "I don't like the smell your mulch".'

Curious neighbors can also disrupt farmers' work by coming onto their property to ask them about the operations. For example, one farmer described that

'A few people a day would stop, like drive right in our driveway, and get out of their car and just blatantly ask, "What are you doing here? Are you building a subdivision?"... You can imagine: My son standing next to me dripping sweat, and we're planting things, looking at these people like "does this look like a subdivision to you?"'

Farmers also need to be conscious of their neighbors' activities, for example, weeds that are sprayed with chemicals. This can prevent USDA certification as the organic standards require production to be at least 15 ft away from areas where non-approved chemicals are applied. For urban farmers, that is often out of the question because they are maximizing their square footage for production space. Conversely, an adjacent property that is not maintained can yield weed problems on farms. One farmer explained that some neighbors

'are very meticulous and heavily maintain their property... they might use chemicals, you know, along the property line to kill the weeds or something like that. Or they may be the opposite, and they don't maintain anything'.

One farmer expressed the intersection of the issues of land development, pollution, and neighbors as follows:

'They're threatening to change our zoning borders... our agricultural district is getting smaller and smaller and more high-density buildings are being constructed so there's a lot of people coming closer, and my neighbors are complaining that random people are coming into their property and picking their coconuts, you know, so there's security issues. Additionally, and we wanted originally wanted to be a place of oasis for city people could get away and experience nature, but now at night you hear the city sounds, cars and rap music and just a lot of city lights, a lot more light pollution happening though. It's inevitable, though, just have to accept it'.

Labor barriers and disadvantages

Just under half of the interviewed farmers ($n = 14$) discussed labor as a barrier. Ten indicated that the specific issue is the lack of skilled laborers rather than an overall shortage of workers. Only three farmers explicitly stated that labor is costly. The more fundamental labor issue for urban farmers seems to be the availability and reliability of skilled farmworkers. Farmers report several ways this affects their farm, including: needing employees who have advanced degrees for specialized tasks, seeking workers who have multiple skills, and lacking workers who are trained for labor-intensive work. One farmer explained that 'Most people come to try out for work, but they just can't work in a professional pace. They will get there and leave within a week or two, or even six months sometimes. It's a big challenge to make a product with a workforce that is below skilled—unskilled—essentially'. Few farmers explained why they think this is occurring, but those that did hypothesize that farming is not valued as a society. The perception of farm work as hard, manual labor and no opportunity for advancement in the farm business does not attract many applicants. For example, one farmer said that 'they teach people "You better work hard in school, or else you're going on to do manual work the rest of your life"—like it's a bad thing'. One farmer summarized the overlapping difficulties in finding people who have the unique set of skills needed to work on a CUA farm: 'It's a multifaceted individual that we need

to ... use a tractor and also sell stuff at the market. It's been so hard to get even immigrants to work and agriculture, because ... they're doing the painting and the construction jobs. For 20 bucks an hour, they're getting like much better jobs now'.

Opportunities

The pre-interview survey asked urban farmers to indicate what they think are the top three opportunities for their farm (see Table 5). In the interviews, two-thirds of farmers ($n = 19$) identified value-adding by processing as an opportunity to increase revenue, provide more variety for consumers and reduce waste. These benefits are especially important for small-scale CUA farmers who are seeking to increase revenue in the limited space they have available. As one farmer described: 'Value added just makes a ton of sense because I'm a super small farm, so any way that I can multiply my profits on the crops... in the very limited space that I have seems to make the most sense for growing the business or multiplying revenue'. While value-added production is a key opportunity for CUA farmers, farmers also mentioned that the cost of building or renting a commercial kitchen, the time it takes to learn relevant codes, and needing staff to produce value-added were all barriers to capitalizing on that opportunity.

More than half of farmers ($n = 18$) discussed online sales as one promising opportunity because it makes purchases easy for consumers, requires little overhead and it builds in an additional revenue stream. Farmers discussed that online sales and delivery are a good opportunity because of the changing expectations and preferences of today's consumers. One farmer described a key opportunity in:

'Getting more techie ... Doorstep Delivery type things, I think that's the way people are going to go in the future... they're going to want Instacart for farms, and, if they can order stuff online at night, while they're just on the couch or something like that, and you could bring it to them the next day... that's, honestly, the new value added'.

Farmers ($n = 13$) reported agritourism as an easy and low effort addition to a farm business because they can take advantage of their proximity to their customers and potential farm visitors, and they are able to add agritourism without the up-front cost or added effort that adopting new crops requires. One farmer said that

'Agritourism is an amazing opportunity to have additional income without very much effort from us. You know, it just requires one hour of our time to get to give a tour or if it's an event in the in the farm than it's a lot

Table 5. Opportunities to support urban agriculture from pre-interview survey

Opportunity	<i>f</i>	%
Internet/online sales	18	62.07
Value-added products	17	58.62
New fruit or vegetable crops	10	34.48
New market channels/buyers	10	34.48
Agritourism	9	31.03
Other ¹	4	13.79
New animal products	1	3.45

¹Education and workshops.

of income. Like for instance, we could potentially make in one weekend, what we would have to make in like three months'.

Additionally, agritourism can double as an educational experience, fulfilling a farmer's educational goals for their farm. Farmers indicated that their vision for agritourism included on-site vacation rentals and having an event space for rent, for example, 'We want to make it a destination location for people to spend the day there drinking coffee, buying product, hanging out, and enjoying the beauty of a farm in the city—they don't have to drive two or three hours to get to the location'.

Nine farmers said that adopting new crops was a top opportunity for their farm. Farmers indicated that they saw new crops as playing a role in maintaining current customers, differentiating themselves in the market, attracting new customers or contributing to the financial sustainability of their farms. For example, to maintain current customers, some farmers indicated that they wanted to add new crops to diversify their customers' diets and their community supported agriculture (CSA) offerings. To differentiate themselves in the market, one farmer discussed adopting new anchor crops for which the farm could be known, while another discussed the possibility of adopting unique crops, such as purple carrots. To attract new customers, one farmer thought a new opportunity would be to grow crops that are specific to a local demographic, for example, growing more Asian vegetables to attract new customers from the large Asian population living near the farm. One farmer discussed using new crops to capture 'niche markets or culturally specific markets that you know not everyone's already trying to capture... Reaching more and different types of people, not your typical farmers markets people... just different kinds of cultural or ethnic groups'. While new crops were seen as a beneficial opportunity for farms, the farmers did note that finding seed for new crops or having enough space to plant new crops may be barriers to taking advantage of that opportunity.

CUA farmers' needs

We asked farmers what resources or supports they thought would help them to alleviate the barriers that they faced or would help them to take advantage of new opportunities. In addition, we asked farmers what resources could have helped them when they were starting their farm. Farmers mainly reported the need for training, access to capital and a desire for more collaboration among farmers, and improved access to resources.

Sixteen farmers reported training and education as resources that would have been useful during their start-up process. Farmers specifically mentioned apprenticeships and new farmer training, such as farmer mentoring and incubator programs, as valuable resources. One farmer said:

'I think mentoring under other farmers be a great—learning systems and learning things that are appropriate to this area and to the scale it you want to do it on—would have been awesome'. Similarly, another said 'It'd be nice to just have a place, whether it be like an incubator farm or just like or just like a mentor to have, you know, just to kind of learn by just to see someone who's doing it successfully and be able to like model them'.

Six farmers reported that there were either no helpful resources available during start-up or that they were unaware of any helpful resources. 'I can't tell if, you know, there weren't enough resources or if I wasn't good enough at learning or, or, you know, using the resources that are available to me'. Another farmer put the need

for information in starker terms: ‘You can pretty much kiss urban farming goodbye if we ... don’t start lending some support and tools so that our youth can continue to develop their passion’.

When asked what would be most helpful for farmers, the most frequent ($n = 13$) response was a source for streamlined resources to answer questions and address their barriers—the topics the farmers mentioned wanting to know about included zoning and land-use policies, soil maps, crop production for very small-scale operations, business planning and profitability estimates for new crops. Examples farmers mentioned included a system to connect farmers and salespeople, a dedicated organization or website for connecting potential farmers to available land and financial resources, an email listserv for sharing resources among farmers and a formalized entity like a small farm alliance. One farmer said,

‘If I could have heard someone like myself speak 10 years ago, that would have been helpful.... I could have listened to somebody further along in the in the journey to get ideas versus trying to invent things myself. I met a salesperson; he was a busy guy, but he helped me out by just pointing me to somebody and all of a sudden a whole world opened up to me...’.

Similarly, the topic of collaboration came up frequently throughout the interviews. The issue that came up frequently was the frustration and difficulty of keeping farmers organized for long enough to have lasting partnerships. One farmer put it candidly,

‘My best resources were other farmers in the area. And I’m like, I don’t really know what it would look like to facilitate that kind of interaction between farmers or if that’s even doable because of the nature of farmers, you know. It’s been tried and the efforts have been for the worse, it’s like okay we’ll just do this on our own’.

Farmers ($n = 10$) find it difficult to find appropriate or relevant information from Extension agents, city and county officials and scientific studies to help them make informed management decisions. Helpful educational resources that farmers ($n = 8$) mentioned were mentor programs, incubator programs and virtual training. One farmer said:

‘Maybe we would have made it through something with less struggle, but who knows, and it’s hard to say specifically in terms of getting questions answered or finding out that there’s a technology out there that I wouldn’t find out about because the lines of communication are not open’.

Given the prevalence of financial barriers, it was unsurprising that half of the farmers ($n = 15$) discussed capital or funding as a major need for the start-up process. Farmers specifically mentioned that government support in the form of public assistance, grants and subsidies would have been helpful for them. The desire for public funding comes from a place of ‘fairness’ in the food system. As one farmer described, ‘We are already at a disadvantage, you know, just going against all of the subsidized big agriculture... it’s, it’s not really a fair playing field to start... to help get that back to a fair playing field, probably for all small farmers, not just urban farmers, I think would be very helpful’.

This detailed explanation about the kinds of information, tools and resources that CUA operations are seeking to support economic sustainability and foster business expansion provides tangible guidance to organizations seeking to support or educate agricultural producers, such as cooperative Extension or agricultural non-profits.

Conclusion

This qualitative needs assessment study was an important first step in understanding CUA farmers in Florida, their needs and barriers and the opportunities that they see for the future of CUA. While the interviewed farmers were all from the state of Florida, given the global trends toward urbanization these results are applicable more broadly than merely in the southeast USA, as Florida is at the forefront of rapid urbanization trends and is a subtropical climate like much of the most urban areas around the world. The difficulties expressed by the urban farmers in Florida who were interviewed in this study are also being felt, to a lesser extent, by farms that are on the periphery of urban areas.

The urban location for CUA farms makes it difficult to find or afford land to farm, can lead to conflicts with residents who are not used to living next to a farm and creates numerous legal and regulatory hurdles for CUA operations that their rural counterparts do not have to address. With increasing urbanization, some previously rural farms are becoming peri-urban farms, and some peri-urban farms are becoming urban farms. Thus, the barriers and difficulties articulated by the CUA farmers in these interviews are a harbinger for barriers and difficulties that may soon befall many other farmers due to increasing urbanization. These issues are ones that can be addressed by local governments—for example, by establishing long-range, comprehensive plans to protect agricultural land from development, to establish land-use regulations that do not disallow or discourage food production. Extension professionals and food systems advocates can seek to inform local government stakeholders of the importance of including food production in future land-use plans. Extension professionals can develop trainings not only for farmers, to provide resources to address the above-discussed informational needs, but also for local government decision-makers and planners, to help them understand how they can support CUA in their communities.

The CUA farmers in this study see many benefits and opportunities associated with farming in urban spaces, providing a unique opportunity to connect with customers and communities and making it easier to do home delivery or get to farmers markets. These benefits could be facilitated by increased availability of financial resources, public awareness of CUA and informational resources and technical support. Our research highlighted that the most important financial resource may be start-up capital because urban farmers face higher land costs due to their urban location and they are often ineligible for the kinds of loans and resources of which rural farms can avail themselves to start their operations. Increasing public awareness of CUA could reduce some of the tensions CUA farmers reporting having with their neighbors and could bolster the local customer base that the CUA farms rely on. Finally, because CUA farms operate at a different scale and under different constraints than rural farmers, training programs, informational resources and technical support, via non-profits, extension professionals or governmental programs, could foster the economic and environmental sustainability of CUA farms. We used referral sampling because CUA farmers are hard-to-reach population, and while this sampling method limits the generalizability of our study, this research provides a picture of CUA farms and the kinds of support they need, which includes not just information provided in traditional Extension programs, but information specifically targeting very small farms, farmers without experience or education in farming

and training and technical assistance in dealing with zoning, land-use and other local regulations.

Financial support. This research was funded by the University of Florida, Institute of Food and Agricultural Sciences, Support for Emerging Enterprise Development Integration Teams (SEEDIT) grant program and USDA National Institute of Food and Agriculture, Hatch project no. 1023901.

Conflict of interest. No conflicts to disclose.

References

- Charmaz K** (2014) *Constructing Grounded Theory*, 2nd Edn. Thousand Oaks, CA: Sage Publications.
- Gerten C, Fina S and Rusche K** (2019) The sprawling planet: simplifying the measurement of global urbanization trends. *Frontiers in Environmental Science* 7, 1–20. doi: <https://www.frontiersin.org/article/10.3389/fenvs.2019.00140>
- Glaser BG and Strauss AL** (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York, NY: Aldine de Gruyter.
- Goodman LA** (2011) Comment: on respondent-driven sampling and snowball sampling in hard-to-reach populations and snowball sampling not in hard-to-reach populations. *Sociological Methodology* 41, 347–353.
- Guitart D, Pickering C and Byrne J** (2012) Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening* 11, 364–373.
- Hendrickson MK and Porth M** (2012) *Urban Agriculture—Best Practices and Possibilities*. Columbia, MO: University of Missouri Extension, p. 52.
- Horst M, McClintock N and Hoey L** (2017) The intersection of planning, urban agriculture, and food justice: a review of the literature. *Journal of the American Planning Association* 83, 277–295.
- Inwood S and Clark JK** (2013) Farm adaptation at the rural–urban interface. *Journal of Agriculture, Food Systems, and Community Development* 4, 61–78.
- Johnson R and Cowan T** (2019) *2018 Farm Bill Primer: Support for Urban Agriculture* (No. 7-5700). Washington, DC: Congressional Research Service. Available at <https://fas.org/sgp/crs/misc/IF11210.pdf>.
- Kaufman J and Bailkey M** (2000) *Farming Inside Cities: Entrepreneurial Urban Agriculture in the United States* (WP00)K1; p. 124). Madison, WI: Lincoln Institute of Land Policy.
- Koceva MM, Brandmüller T, Lupu I, Önnersfors Å, Corselli-Nordblad L, Coyette C, Johansson A, Strandell H, Wolff P and Europäische Kommission** (eds) (2016) *Urban Europe: Statistics on Cities, Towns and Suburbs* (2016 edition). Publications Office of the European Union. Available at <https://doi.org/10.2785/594675>.
- Miles MB, Huberman AM and Saldaña J** (2014) *Qualitative Data Analysis: A Methods Sourcebook*, 3rd Edn. Thousand Oaks, CA: Sage Publications.
- Northcutt N and Mccoy D** (2004) *Interactive Qualitative Analysis*. Thousand Oaks, CA: SAGE Publications. Available at <https://doi.org/10.4135/9781412984539>.
- Nowell LS, Norris JM, White DE and Moules NJ** (2017) Thematic analysis: striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods* 16, 1609406917733847.
- Oberholtzer L, Dimitri DC and Pressman A** (2014) Urban agriculture in the United States: characteristics, challenges, and technical assistance needs. *Journal of Extension* 52, 1–12.
- Patton MQ** (2015) *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*. Thousand Oaks, CA: Sage Publications.
- Reynolds KA** (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, 197–216.
- Saldana J** (2015) *The Coding Manual for Qualitative Researchers*. Thousand Oaks, CA: Sage Publications.
- US Census Bureau** (2020) *Delineation Files Core Based Statistical Areas*. Washington, DC: The United States Census Bureau. Available at <https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html>.
- USDA Economic Research Service** (2021) *Rural Atlas Data*. Washington, DC: USDA Economic Research Service. Available at <https://www.ers.usda.gov/data-products/atlas-of-rural-and-small-town-america/download-the-data/>.
- USDA National Agricultural Statistics Service** (2017) *Census of Agriculture Appendix A. Census of Agriculture Methodology* (Census of Agriculture). Washington, DC: USDA National Agricultural Statistics Service. Available at https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_US/usappxa.pdf.
- USDA National Agricultural Statistics Service** (2020) *Farms and Land in Farms 2019 Summary*. Washington, DC: USDA National Agricultural Statistics Service, p. 17.