

# Commercial Urban Agriculture in Florida: Needs, Opportunities, and Barriers

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**SUMMARY.** Florida, like much of the southeastern United States, is rapidly urbanizing. With this urbanization, there is an increasing interest in commercial urban agriculture (CUA) as an important sector for agriculture in the state. The U.S. Department of Agriculture Census of Agriculture does not report data about CUA operations, thus limiting the knowledge about the status of CUA operations regarding basic features such as farm size, operator demographics, production systems, sources of revenue, barriers to business operations and profitability, and future opportunities for development. Because previous research has found differences in urban farmers' demographics and their perceptions of barriers and opportunities, the purpose of this research was to characterize CUA operations in Florida and to understand the urban farmers' perceptions of the primary needs, barriers, and opportunities for developing CUA, as well as CUA operators' informational needs and preferred informational formats. We performed a cluster analysis to identify salient groups of urban growers in Florida to identify subgroups based on shared characteristics that revealed three distinct groups of urban farmers with differing perceptions of barriers, opportunities, informational needs, and preferred informational formats.

Florida, like much of the southeastern United States, is rapidly urbanizing. In 2019, Florida was home to 21.5 million residents; this is up from 18.8 million residents just one decade before with an increasing proportion of the population living in urban and peri-urban areas [U.S. Department of Agriculture, Economic Research Service (USDA-ERS), 2021].

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2019). The USDA acknowledges their methodology fails to count farms in underserved areas and those operated by minority populations [USDA, National Agricultural Statistics Service (USDA-NASS), 2017]. This fact is particularly important because research has shown that the demographics of urban farmers differ from those of their rural counterparts, with a larger proportion of young, female, and minority farmers in urban and peri-urban areas compared with rural areas (Inwood and Clark, 2013). Research has shown that CUA has promise for economic development (Sharp et al., 2011); however, CUA operations have different barriers (Castillo et al., 2013), and development of the CUA industry is hindered by research gaps (Weidner et al., 2019).

In addition to the general omission of CUA farms from the Census of Agriculture, there has been limited social science peer-reviewed research of urban agriculture; the bulk of research to date has focused on the urban agriculture in California or in large cities in the midwestern or northeastern United States (Guitart et al., 2012). Most studies have lumped together the myriad activities that collectively fall under the umbrella of “urban agriculture”—including home gardening, community gardens, school gardens, homesteading, and CUA—without differentiating between these distinct activities (Hendrickson and Porth, 2012; Oberholtzer et al., 2014; Reynolds, 2011). There has been limited research specifically focused on CUA, and the most recent research in the southeast approached the topic through the perspective of urban planners and regulators rather than the specific needs of producers (Campbell, 2021; Campbell and Rampold, 2021; Fricano and Davis, 2020) or by looking at the needs of urban agriculture producers in a rural state (Arkansas) rather than an urban state such as Florida (Sanders et al., 2021). Additionally, none of these recent studies focused specifically on the perspective of commercial or for-profit urban agriculture operations in an urban state.

In Florida, 44 of 67 counties are classified as urban counties by the USDA; this is up from 38 counties in 2003 (USDA-ERS, 2021). Because agriculture is one of the top three industries in Florida, this increase in urbanization has led to a corresponding increasing interest in and focus on developing CUA as an important sector of agriculture in the state.

The 2018 farm bill included a provision supporting urban, indoor, and emerging production systems that specified the necessity of an urban agriculture census. However, congress did not appropriate funds for the urban agriculture census to be conducted. Additionally, the federal government has stated “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,

Units			
To convert U.S. to SI, multiply by	U.S. unit	SI unit	To convert SI to U.S., multiply by
0.4047	acre(s)	ha	2.4711
0.0929	ft <sup>2</sup>	m <sup>2</sup>	10.7639

Although previous research has focused on other geographic regions in the United States or has not focused specifically on CUA, there are some recurring themes in the primary barriers to urban agriculture activities and needs of urban farmers. Like many small farms, CUA operations struggle with profitability, financing, labor, business management, and access to land (Kaufman and Bailkey, 2000; Oberholtzer et al., 2014). Because CUA farms are operating in urban areas, they have barriers and needs that their rural counterparts do not, including barriers caused by land-use regulations, zoning, code enforcement, and conflicts with community members and neighbors (Hendrickson and Porth, 2012; Horst et al., 2017; Oberholtzer et al., 2014; Reynolds, 2011). With the exception of a recent white paper (Rangarajan and Riordan, 2019), previous research has failed to address future opportunities for CUA operations or developing CUA as opposed to merely looking at the needs and barriers to urban agriculture. This research aimed to address the gap in the literature regarding the current status of CUA in Florida, a rapidly urbanizing state in the southeastern United States and to identify CUA farmers' perceptions of barriers, opportunities, and needs for their operations.

## Materials and methods

Based on a review of the literature and previous research focused on CUA conducted by the research team, a survey was developed to learn about Florida farmers' barriers to urban farming, their needs to support business viability and profitability, as well as their perceptions of future business opportunities, the usefulness of training topics, and their preferred informational formats. An expert panel of social scientists who conduct research addressing topics in food and agriculture reviewed the survey for face value and content validity. The research team revised the survey and conducted cognitive interviews of CUA farmers. Cognitive interviewing is a process used to identify and correct problems with survey questions by using a facilitator to collect verbal information from individuals in the target population to ensure that the questions are understood in the way the research team intends (Beatty and Willis, 2007). The cognitive interviews we conducted assessed the face value of the survey

questions and ensured that the questions were understood by CUA farmers in Florida.

The survey was distributed via a survey platform (Qualtrics, Provo, UT) to Florida farmers ( $n = 70$ ) who were suggested by a referral sample from extension agents and other urban farmers. The survey was also distributed by extension agents who work with urban farmers and by relevant listservs and industry group newsletters, including the Florida Sustainable Agriculture Research and Education, the Florida Nursery Growers and Landscape Association, and the Florida Black Farmers and Agriculturalists Association. Responses were collected in Summer 2021, with a total of 53 valid responses. Survey respondents were from all major metropolitan areas. The research conducted during this study was approved by University of Florida Institutional Review Board (study #IRB202000516).

Survey respondents were asked to select only their top three barriers and opportunities so that survey responses would reflect the most important barriers and opportunities of CUA operations. The training topics and formats were rated using a 5-point ordinal scale for two sets of bipolar descriptors (1 = not at all useful; 5 = extremely useful). Real limits were set for the interpretation of responses: 1.00 to 1.49 = not at all useful; 1.50 to 2.49 = slightly useful; 2.50 to 3.49 = moderately useful; 3.50 to 4.49 = very useful; and 4.50 to 5.00 = extremely useful. We collected basic demographic information about survey respondents and characteristics of their operations. We used statistical software (IBM SPSS Statistics for Windows version 26.0; IBM Corp., Armonk, NY) to calculate descriptive statistics.

We performed a cluster analysis to identify salient groups (or clusters) of urban growers in Florida. In the absence of class labels, clustering is a useful machine learning tool that allows for the identification of subgroups from a set of individuals (or subjects) based on shared characteristics or similar attributes, and members of a particular cluster are more like each other than members of other clusters (Huang, 1998; Xiao et al., 2019; Zafar and Swarupa Rani, 2021). Homogenous clusters were formed based on growers' demographic variables (i.e., age, sex, educational attainment, race, and farming experience),

farm attributes (i.e., farm size, years of operation, land ownership, and Florida's Greenbelt classification status), perceived barriers, opportunities, and sources of information. After eliminating missing data, the sample used for the cluster analysis was composed of 50 urban farmers in the state of Florida. The analysis was conducted using statistical software (R version 3.6.2; R Core Team, Dortmund, Germany). Specifically, we performed K-modes clustering of categorical data. The K-modes algorithm, first proposed by Huang (1997, 1998), partitions subjects (in this case, urban growers in Florida) into K groups (or clusters) in a way that the distance between subjects and the assigned cluster modes is minimized.

## Results and discussion

**DEMOGRAPHICS AND FARM CHARACTERISTICS.** As shown in Table 1, 20% of survey respondents were younger than 40 years, which the USDA qualifies as a young farmer. Nearly half (45%) of respondents were women farmers. Although racial minorities were represented, survey respondents were mostly white, which is reflective of statewide rural farmer demographics. Approximately 10% of CUA farmers reported being Hispanic or Latino. The CUA farmers responding to our survey were highly educated, with more than two-thirds (70%) having a bachelor's degree or higher education degree. More than half (53%) of survey respondents had  $\leq 10$  years of experience, which the USDA classifies as new and beginning farmers. The overwhelming majority of survey respondents had a leadership or decision-making role at the farm, with more than 92% being the farm owner, farm manager, or farm owner and manager.

The majority (68%) of the farms were for-profit, commercial enterprises. To be included in the survey, the farms needed to have some commercial component. Some CUA operations also have a nonprofit status, and a small proportion (23%) of our respondents indicated their operations primarily or partially operated with a nonprofit status. These nonprofits are typically urban farms with a social mission to increase food access in limited-resource communities. In terms of farm ownership by underrepresented groups, 42% of respondents represented women-owned farms, with a small proportion

**Table 1. Demographics and personal characteristics of commercial urban agriculture survey respondents in Florida (N = 53).**

Variable	Survey responses	
	(no.)	(%)
Farm role		
Owner and manager	30	56.6
Owner	16	30.2
Manager	3	5.7
Employee	2	3.8
Volunteer	2	3.8
Experience (years)		
1–2	8	15.1
3–5	13	24.5
6–10	7	13.2
More than 10	25	47.2
Age (years)		
20–29	4	7.5
30–39	7	13.2
40–49	14	26.4
50–59	11	20.8
60–69	13	24.5
Older than 70	3	5.7
Sex		
Female	24	45.3
Male	28	52.8
Race		
White	43	81.1
American Indian or Alaska Native	4	7.5
Asian	4	7.5
Black or African American	2	3.8
Hispanic or Latino		
Yes	5	9.4
No	47	88.7
Highest level of education		
High school diploma or test of general education development (GED)	1	1.9
Some college, technical, or vocational training	12	22.6
Bachelor's degree	25	47.2
Master's degree or higher degree	12	22.6
School major		
Engineering/computer science/mathematics	2	3.8
Health	3	5.7
Life/physical sciences (not including agriculture)	3	5.7
Vocational/technical	4	7.5
Education	5	9.4
Social/behavioral sciences	5	9.4
Humanities	6	11.3
Other	7	13.2
Business/management	8	15.1
Agricultural science/management	9	17.0

of farms being veteran-owned or minority-owned (15% and 13%, respectively).

Survey respondents were asked whether their farm or an employee of the farm had specific certifications. Overall, very few farms had any formal certification, with the largest proportion being the Greenbelt agricultural tax status (23%), followed by the Food Safety Modernization Act certification

(17%). Commercial agricultural producers in many areas of the Florida are legally required to enroll in the state's agricultural best management practices (BMP) program, a statewide program that protects water quality, and all commercial operations are encouraged to participate. However, during our survey of CUA producers, only 13% of farms indicated they were enrolled in

the BMP program. Although it is not clear how many of our survey respondents are legally required to participate, this limited participation in the BMP program among CUA producers points to an important opportunity for outreach and enrollment of these commercial farms.

There was an almost even split between farms that had been in operation for  $\leq 4$  years (45%) and those that had been in operation for  $\geq 5$  years (55%). CUA farms responding to our survey had very small amounts of land in production, with more than half (57%) farming less than 2 acres in production and 40% producing on  $\leq 1$  acre. In comparison, the average size of a Florida farm is 246 acres (USDA-NASS, 2020).

The majority (72%) of survey respondents owned their land as opposed to having a written or verbal lease or another arrangement (Table 2). To assess the number and types of employees working at these farming operations, we asked how many full-time or part-time employees, volunteers, and interns the operations employed. Almost 90% of respondents indicated they had either no full-time employees or less than five full-time employees. Approximately half (49%) of farms had no part-time employees, and 42% indicated they had no more than five part-time employees. There was similarly little representation by unpaid employees (Table 3).

As has been found by previous research (Inwood and Clark, 2013), during our survey, the demographics of these CUA farmers differed from rural farmers because they had a larger proportion of female producers (45%), were younger, were highly educated, and had degrees in subjects that were primarily outside of agriculture. These CUA farmers are relatively new to farming, with approximately half of the farmers (53%) being new or beginning farmers. These CUA operations were relatively new, with approximately half of the farms (45%) operating for less than 5 years. The newness of the farms may explain why very few of the farms have certifications, such as the Food Safety Modernization Act certification (17%) or USDA Certified Organic (8%).

The most common production method and system used on farms was in-ground (77%), followed by raised beds (34%), containers or pots (32%), and high tunnels (30%). Farmers selected all production methods they

**Table 2. Farm characteristics of commercial urban agriculture survey respondents in Florida (N = 53).**

Variable	Survey responses	
	(no.)	(%)
Operation type		
For-profit	36	67.9
Nonprofit	12	22.6
Women-owned	22	41.5
Veteran-owned	8	15.1
Minority-owned	7	13.2
Farm or employee certifications		
Greenbelt/agricultural exemption tax status	12	22.6
Food Safety Modernization Act certification	9	17.0
Good Agricultural Practices	7	13.2
Private pesticide applicator certification	7	13.2
Enrolled in Florida Department of Agriculture Best Management Practices program	7	13.2
USDA certified organic	7	7.5
Good Handling Practices certification	2	3.8
Certified naturally grown	2	3.8
Operation time (years)		
Less than 1	4	7.5
1–2	14	26.4
3–4	6	11.3
≥5	29	54.7
Land in production <sup>2</sup>		
Less than 500 ft <sup>2</sup>	5	9.4
Between 500 and 1000 ft <sup>2</sup>	3	5.7
Between 1000 ft <sup>2</sup> and 1 acre	13	24.5
Between 1 and 2 acres	9	17.0
Between 2 and 10 acres	12	22.6
More than 10 acres	9	17.0
I do not know	1	1.9
Property access		
Own property	38	71.7
Written lease	10	18.9
Other	3	5.7
Nonlease agreement with property owner	2	3.8

<sup>2</sup>1 ft<sup>2</sup> = 0.0929 m<sup>2</sup>, 1 acre = 0.4047 ha.

used, and it is important to note that the answer choices were not mutually exclusive (Table 4). Farmers were asked to indicate all the crops or services that generated revenue for their farm in 2020. The most common revenue source for CUA farmers in Florida was vegetables (64%), followed by herbs and spices (43%) and fruit (42%) (Table 5).

Survey respondents were also asked to indicate their top three market outlets by value of sales. Nearly half (43%) of farmers surveyed sell at farmers markets as one of their top three market outlets. Other top outlets were on-farm sales such as a stand, store, or u-pick (36%), online (23%), community-supported agriculture (CSA) (21%), and wholesale

(21%). The focus of the CUA farms on direct-to-consumer market channels makes sense because of their proximity to consumers (Table 6).

Because controlled environment production is often associated with CUA, we anticipated a greater proportion of survey respondents who reported growing in greenhouses or indoors. An overwhelming majority were growing in-ground (77%), and all but two farms that grew in a greenhouse also grew in-ground. Most survey respondents indicated they were using two or more production systems—only 15 of 53 farms were using just one system, and 11 of those farms were growing in-ground. The diversity of production systems on CUA farms highlights the fact that despite the assumption that CUA is a commonly controlled environment production, CUA in Florida is characterized by a diversity of production systems and methods, and the majority of CUA farms perform in-ground and outdoor farming.

**SURVEY RESPONDENTS' BARRIERS TO FARM OPERATIONS AND PROFITABILITY.** Farmers were asked to select the top three barriers faced by their farms (Table 7). Labor was selected as one of the top three barriers by the most survey respondents. One potential reason for this is that the survey was conducted in mid-2021, when the United States was experiencing a labor shortage. Another reason for this may be the diversity of activities occurring on these small, diversified CUA farms. The variety of production systems, crops, and market channels may make it difficult to find people who have the unique set of skills the farms need. Additionally, some of the technologically advanced CUA operations may need employees with advanced degrees to perform specialized tasks.

Two financial barriers—access to capital and profitability—were the second

**Table 3. Number of farms with employees by employment type and number of employees based on a survey of commercial urban farms in Florida (N = 53).**

Employees (no.)	Survey respondents							
	Full-time		Part-time		Volunteer		Intern	
	(no.)	(%)	(no.)	(%)	(no.)	(%)	(no.)	(%)
None	23	43.4	26	49.1	23	43.4	36	67.9
1–5	24	45.3	23	43.4	22	41.5	14	26.4
6–10	4	7.5	1	1.9	4	7.5	1	1.9
≥11	2	3.8	3	5.7	4	7.5	2	3.8



**Table 4. Production methods used by commercial urban agriculture operations in Florida (N = 53).**

Production method	Survey respondents	
	(no.)	(%)
Growing in-ground in beds, rows, or fields	41	77.4
Raised beds/garden boxes	18	34.0
Containers or pots	17	32.1
High tunnel/hoop house (removable flexible plastic walls)	16	30.2
Greenhouse (permanent rigid walls)	10	18.9
Hydroponic	8	15.1
Indoor (a building other than greenhouses, high tunnels, and hoop houses)	6	11.3
Aquaponic	1	1.9

and third most selected barriers in the survey. The inaccessibility of capital for CUA farms may be rooted in the fact that they are ineligible to apply for grants or loans available to their rural counterparts. As was anticipated by the review of literature, barriers from laws and regulations were also a common barrier for CUA farms in Florida. Zoning sometimes explicitly precludes urban agriculture; however, it often does not address agricultural activities. Land access is a barrier because of decreasing land availability caused by commercial and residential development. Additionally, competition from land developers drives up land prices, and urban high-density zoning supports housing development over agricultural use.

**FUTURE OPPORTUNITIES FOR BUSINESS DEVELOPMENT AND EXPANSION.** Farmers were asked to select from a list of what they view as the top three opportunities to increase revenue or expand their farm or organization during the next 3 years (Table 8). The opportunities selected as among the top three most promising by respondents were

spread across categories. Only two opportunities were selected by  $\geq 30\%$  of survey respondents: value-added products and agritourism. Value-adding by processing can increase revenue, provide more variety for consumers, and reduce waste (Pfeiffer et al., 2015). These benefits are especially important for small-scale CUA farmers who are seeking to increase revenue in the limited space they have available. Agritourism is attractive to CUA farms because they can take advantage of their proximity to customers and potential farm visitors, and they are able to add agritourism to their operation without the up-front cost or added effort that adopting new crops requires. There was an almost even split of respondents indicating new fruit crops, new vegetable crops, online sales, and offering training or workshops, with 25% to 28% indicating one of those four opportunities were among their top three. New crops can be a way for CUA farms to differentiate themselves in the market, attract new customers, and contribute to the financial sustainability of their farms.

**Table 5. Sources of revenue for commercial urban agriculture survey respondents in Florida (N = 53).**

Source of income	Survey respondents	
	(no.)	(%)
Vegetables	34	64.2
Herbs and spices	23	43.4
Fruit (including berries, melons, and tree fruits)	22	41.5
Cut flowers, ornamentals and other nonedible plants	17	32.1
Animal products (such as eggs or dairy)	13	24.5
Value-added products (jams, preserves, soaps, etc.)	13	24.5
Educational services	10	18.9
Agritourism services (farm tours and events)	9	17
Animals	5	9.4
Mushrooms	2	3.8

Online sales can make purchases easy for consumers, require little overhead, and build an additional revenue stream for farms. In addition, as consumers increasingly prefer and expect convenience, online sales and delivery are a good opportunity for CUA farms to compete with other food delivery options in an increasingly crowded urban market. Because of the proximity of CUA to consumers, it makes sense that agritourism, online ordering, and home delivery were identified as key opportunities for CUA farms.

**SURVEY RESPONDENTS' TRAINING AND INFORMATION PREFERENCES.** We asked about the usefulness of training topics and the usefulness of potential sources of information or training formats. All topics were considered to be very useful (Table 9). With mean scores of  $\geq 4$  (1 = not at all useful; 5 = extremely useful), the most useful topics were new crops and products, new technology and production methods, and marketing and sales. Using the same scale, respondents rated sources of information based on usefulness. All sources of information and training formats were considered moderately or very useful (Table 10). The sources of information considered most useful were fellow growers, followed by extension agents.

Training and educational materials for CUA producers should focus on various aspects of financial sustainability because farms indicated they had several financial barriers, including access to capital, profitability, sales and marketing, and business management. These operations and operators are newcomers; therefore, many of these farmers are struggling to find sources of information appropriate to their operations and support from farmers like them. This explains why all the information and training topics had mean scores of very useful, and why "fellow growers" was the top-rated source of information, with the top four sources of information being people or in-person events. It is notable that consultants and salespersons were rated as the least useful source of information for CUA operations because large-scale rural growers often rely on consultants and salespersons as a key source of information.

**CLUSTER ANALYSIS RESULTS.** Based on the elbow method (Yuan and Yang, 2019), we identified three

**Table 6. Top three market outlets where commercial urban agriculture survey respondents in Florida sell their products (N = 53).**

Market outlet	Survey respondents	
	(no.)	(%)
Farmers' markets	23	43.4
On-farm sales (u-pick, store, or farm stand)	19	35.8
Online marketplaces	12	22.6
Community-supported agriculture	11	20.8
Wholesale	11	20.8
Restaurants or caterers	10	18.9
Grocery or other retail stores (direct sales, not wholesale)	9	17.0
Cooperatives	4	7.5
Food hubs	3	5.7
Institution	2	3.8

**Table 7. Top three barriers to farm operations and business expansion for commercial urban agriculture survey respondents (N = 53).**

Barrier	Survey respondents	
	(no.)	(%)
Labor	21	39.6
Access to capital	18	34.0
Profitability	15	28.3
Laws/regulations	15	28.3
Pest management	14	26.4
Sales/marketing	13	24.5
Business management	8	15.1
Crop management	7	13.2
Access to land	7	13.2
Conflicts or lack of support from surrounding community	6	11.3
Lack of organization among/support from other urban farmers	4	7.5
Food safety	2	3.8

**Table 8. Commercial urban agriculture survey respondents' top three opportunities for increasing revenue or business expansion during the next 3 years (N = 53).**

Opportunity	Survey respondents	
	(no.)	(%)
Value-added products	19	35.8
Agritourism (farm tours and events)	16	30.2
New fruit crops	15	28.3
Online sales	15	28.3
Offering training or workshops	15	28.3
New vegetable crops	13	24.5
Sales to restaurants	10	18.9
Home delivery	9	17.0
New animal products	3	5.7
Institutional sales (such as farm-to-school)	3	5.7
None (we do not want to expand)	3	5.7

homogenous clusters. Table 11 presents the demographic characteristics of urban growers and farm attributes by cluster and the total sample. The first cluster (n = 17), labeled “mainly female growers” (cluster 1), mainly comprised female urban farmers in Florida. In cluster 1, most farmers were White and 50 years of age or older. In cluster 1, 76% of growers reported farm sizes ranging from 1000 ft<sup>2</sup> to 10 acres, indicated being owners of the land where the farm was located, and received Florida’s Greenbelt agricultural tax classification. In cluster 1, 53% of the growers reported having ≤10 years of farm experience, and close to 65% of farmers said their farms had been operating for more than 4 years. The second cluster (n = 19) was labeled “mainly male and experienced growers” (cluster 2). In cluster 2, 58% of urban farmers indicated being 50 years of age or older, and close to 90% were male and owners of agricultural land. More than 70% of the growers in this cluster had educational attainment of at least a college degree, were White, and had farmed for more than 10 years. In terms of farm attributes, most producers in cluster 2 indicated having farms of more than 2 acres (68%), being in operation for more than 5 years (89%), and receiving the Greenbelt agricultural tax classification for their land (74%). Finally, we labeled cluster 3 (n = 14) as “younger, college-educated growers.” In this cluster, most farmers were younger than 50 years old (93%), had educational levels of college degrees or higher education degrees (86%), and had ≤10 years of farm experience (93%). Farmers in cluster 3 responded that they had farms that were between 1000 ft<sup>2</sup> and 1 acre (79%), and the majority had been in operation for less than 5 years.

Table 12 presents the perceived barriers, opportunities, and sources of information by cluster and for the entire sample. Most respondents in cluster 1 did not perceive barriers related to financial, labor, management, and production issues. Notably, 94% of growers in this cluster stated that they did not perceive social issues as barriers to the operation and sustainability of their urban farms. Farmers in cluster 1 primarily considered the production of new crops as potential business

**Table 9. Perceived usefulness of training topics for commercial urban agriculture survey respondents in Florida (N = 53).**

Training topic	Perceived usefulness (1–5 scale) <sup>z</sup>	
	Mean	SD
New crops and products	4.09	0.883
New technology and production methods	4.04	1.109
Marketing and sales	4.00	1.120
Pest management	3.98	1.163
Supporting sustainability and environmental goals	3.91	1.244
Crop production	3.90	1.053
Farm finances (pricing, calculating cash flow, record-keeping, etc.)	3.85	1.321
Fostering societal and health benefits	3.62	1.213
Urban soil management (contamination, amendments, etc.)	3.53	1.391
Food safety certification	3.53	1.295

<sup>z</sup>1 = not at all useful; 5 = extremely useful.

opportunities for their enterprises. Regarding sources of information, more than 65% of growers indicated benefiting the most from information gathered from fellow farmers, extension agents, and crop consultants, as well as from online and printed resources. Conversely, 59% of farmers in this group reported that the information obtained through technical training and other informational events was not necessarily valuable. In cluster 2, most growers perceived financial issues (68% of respondents in the cluster), labor constraints (68%), and management and production challenges (55%) as the main barriers to their operations. In terms of opportunities, 63% of growers selected new market channels and 79% indicated alternative enterprises (e.g., agritourism). All urban growers in cluster 2

agreed that the information gathered through printed and online media and information received from other people (e.g., farmers, extension agents, consultants) were useful sources of information, and 90% agreed that technical training was a useful source of information when making decisions about their operations. Finally, growers in cluster 3 indicated that the most pressing challenges in the operations were financial barriers (71% of respondents in the cluster) and management and production issues (100% of growers in the cluster). Regarding the potential opportunities for business growth and expansion, new and value-added products (64%), new market channels (64%), and alternative enterprises (79%) were selected by farmers in this cohort. In terms of source of information, growers in

**Table 10. Commercial urban agriculture survey respondents' perceived usefulness of sources of information (N = 53).**

Source of information	Perceived usefulness (1–5 scale) <sup>z</sup>	
	Mean	SD
Fellow growers	4.40	0.884
Extension agents	4.13	0.921
Field days, farm tours, and field demos	4.11	1.086
Workshops/conferences	4.04	1.037
Online videos such as YouTube (Google LLC, Mountain View, CA)	3.91	1.061
Electronic resources that can be read online or downloaded and printed	3.91	1.148
Websites	3.89	0.934
Printed bulletins/fact sheets	3.58	1.336
Social media, such Instagram (Meta, Menlo Park, CA) or Facebook (Meta)	3.45	1.309
Consultant/salesperson	3.21	1.215

<sup>z</sup>1 = not at all useful; 5 = extremely useful.

cluster 3 indicated that useful information was obtained from technical training and informative events (93% of growers in this cluster), other farmers and consultants (86%), and printed and online resources (86%).

## Conclusions

This needs assessment study was an important first step in understanding CUA farmers in Florida, their needs and barriers, and the opportunities they see for the future of CUA in Florida. The urban location of CUA farms provides both benefits and problems. It provides a unique opportunity to connect with customers and communities, and it makes it easier to provide home delivery or go to farmers markets near their clientele. However, that proximity makes it difficult to find or afford land to farm, and it creates numerous legal and regulatory hurdles for CUA operations that their rural counterparts do not have to address.

Because urban farms are not included in the USDA Census of Agriculture, the total number of urban farms in Florida is unknown. Unlike some other segments of the agricultural industry, such as nursery growers, cattleman, or citrus (*Citrus* sp.) growers, CUA farmers do not have an industry organization specifically focused on their operations and needs. Therefore, we used convenience sampling for the survey because CUA farmers are a hard-to-reach population. This sampling method prevents the possibility of calculating a response rate and ensuring that our sample was representative. Although this sampling method limits the generalizability of our study, this research provides an initial picture of who Florida's CUA farmers are, characteristics of CUA operations, and the types of support they need. The cluster analysis showed that urban farmers are not a monolith—they differ in demographic characteristics, perceptions of barriers and opportunities, and informational needs and preferred sources of information.

These findings highlight ways that local governments can support urban farmers in their jurisdictions. In particular, by understanding the sizes and types of activities that occur on CUA farms, local governments can more effectively craft local land-use policies and codes of ordinances to support urban food production. For example, a

Table 11. Results of clustering analysis of demographic characteristics and farm attributes of 50 commercial urban agriculture operations in Florida.

Farmer characteristics	Cluster 1: Mainly female growers (n = 17)		Cluster 2: Mainly male and experienced growers (n = 19)		Cluster 3: Younger, college-educated growers (n = 14)		Full sample (n = 50)	
	(no.)	(%)	(no.)	(%)	(no.)	(%)	(no.)	(%)
Age (years)								
Younger than 50	3	17.65	8	42.11	13	92.86	24	48.00
50 or older	14	82.35	11	57.89	1	7.14	26	52.00
Sex								
Female	15	88.24	2	10.53	5	35.71	22	44.00
Male	2	11.76	17	89.47	9	64.29	28	56.00
Educational attainment								
Some college or less	7	41.18	5	26.32	2	14.29	14	28.00
College	5	29.41	10	52.63	10	71.43	25	50.00
Graduate studies	5	29.41	4	21.05	2	14.29	11	22.00
Race								
Nonwhite	2	11.76	4	21.05	2	14.29	8	16.00
White	15	88.24	15	78.95	12	85.71	42	84.00
Farming experience (years)								
≤10	9	52.94	4	21.05	13	92.86	26	52.00
More than 10	8	47.06	15	78.95	1	7.14	24	48.00
<b>Farm attributes</b>								
Farm size <sup>a</sup>								
1000 ft <sup>2</sup> or less	3	17.65	1	5.26	3	21.43	7	14.00
Between 1000 ft <sup>2</sup> and 1 acre	5	29.41	0	0.00	8	57.14	13	26.00
Between 1 and 2 acres	4	23.53	5	26.32	0	0.00	9	18.00
Between 2 and 10 acres	4	23.53	6	31.58	2	14.29	12	24.00
More than 10 acres	1	5.88	7	36.84	1	7.14	9	18.00
Operation time (years)								
Less than 5	6	35.29	5	26.32	10	71.43	21	42.00
≥5	11	64.71	14	73.68	4	28.57	29	58.00
Own land								
Owner	13	76.47	17	89.47	7	50.00	37	74.00
Nonowner	4	23.53	2	10.53	7	50.00	13	26.00
Florida's Greenbelt/agricultural classification								
Yes	13	76.47	14	73.68	12	85.71	39	78.00
No	4	23.53	5	26.32	2	14.29	11	22.00

<sup>a</sup>1 ft<sup>2</sup> = 0.0929 m<sup>2</sup>; 1 acre = 0.4047 ha.



Table 12. Results of a clustering analysis of perceived barriers, perceived future opportunities, and preferred sources of information involving 50 commercial urban farmers in Florida.

Perceived barriers	Cluster 1: Mainly female growers (n = 17)		Cluster 2: Mainly male and experienced growers (n = 19)		Cluster 3: Younger, college-educated growers (n = 14)		Full sample (n = 50)	
	(no.)	(%)	(no.)	(%)	(no.)	(%)	(no.)	(%)
<b>Financial</b>								
Yes	6	35.29	13	68.42	10	71.43	29	58.00
No	11	64.71	6	31.58	4	28.57	21	42.00
<b>Labor</b>								
Yes	4	23.53	13	68.42	3	21.43	20	40.00
No	13	76.47	6	31.58	11	78.57	30	60.00
<b>Social issues</b>								
Yes	1	5.88	2	10.53	2	14.29	5	10.00
No	16	94.12	17	89.47	12	85.71	45	90.00
<b>Laws/regulatory issues</b>								
Yes	3	17.65	5	26.32	6	42.86	14	28.00
No	14	82.35	14	73.68	8	57.14	36	72.00
<b>Management and production</b>								
Yes	6	35.29	10	52.63	14	100.00	30	60.00
No	11	64.71	9	47.37	0	0.00	20	40.00
<b>Perceived opportunities</b>								
<b>New crops</b>								
Yes	12	70.59	5	26.32	3	21.43	20	40.00
No	5	29.41	14	73.68	11	78.57	30	60.00
<b>New and value-added products</b>								
Yes	4	23.53	5	26.32	9	64.29	18	36.00
No	13	76.47	14	73.68	5	35.71	32	64.00
<b>New market channels</b>								
Yes	5	29.41	12	63.16	9	64.29	26	52.00
No	12	70.59	7	36.84	5	35.71	24	48.00
<b>Alternative enterprises</b>								
Yes	6	35.29	13	68.42	11	78.57	30	60.00
No	11	64.71	6	31.58	3	21.43	20	40.00
<b>Perceived usefulness of sources of information</b>								
<b>People (e.g., fellow farmers, extension agents, crop consultants)</b>								
Yes	11	64.71	19	100.00	12	85.71	42	84.00
No	6	35.29	0	0.00	2	14.29	8	16.00
<b>Technical training and other informational events</b>								
Yes	7	41.18	17	89.47	13	92.86	37	74.00
No	10	58.82	2	10.53	1	7.14	13	26.00
<b>Online and printed resources</b>								
Yes	11	64.71	19	100.00	12	85.71	42	84.00
No	6	35.29	0	0.00	2	14.29	8	16.00

local government could add urban agricultural activities as a primary use on parcels of land in specific zoning categories so that farms will not need to petition to receive special permission to operate commercial agricultural activities on their land.

These findings are also important for extension educators who are seeking to develop programs to support the development of CUA. Specifically, CUA operators' perceptions of barriers and informational preferences provide guidance for the types of programs that extension could develop to help CUA operators navigate those barriers or provide information that they need to sustain or expand their operations. In addition, the cluster analysis is particularly useful for providing information about topics that are of specific interest to the different types of urban farmers, as well as for providing that information in the format that is preferred by the different groups. For example, if one wanted to create useful training for younger, college-educated growers (cluster 3), then an in-person, technical training program to help them address their financial barriers and issues with farm management and production should be created. Conversely, women farmers (cluster 1) prefer not to attend technical training or events and do not indicate that they have the same barriers as cluster 3. However, cluster 1 farmers are more interested in learning about new crops than the other two clusters.

This study provided an initial assessment of CUA in a rapidly urbanizing state in the southeastern United States. CUA is poised to provide hyperlocal food to Florida's rapidly growing urban population, and the prospects for future business development and expansion are promising if urban farmers are provided with supportive policies and regulations from their local governments and training tailored to their specific needs.

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