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On the Path to a Resilient Urban Food System in a Rural State: A Mixed-Method Needs Assessment of Urban Producers and County Extension Agents in Arkansas

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On the Path to a Resilient Urban Food System in a Rural State: A Mixed-Method Needs
Assessment of Urban Producers and County Extension Agents in Arkansas

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Agricultural and Extension Education

by

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Bachelor of Arts in Spanish, 2017

August 2019
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This thesis is approved for recommendation to the Graduate Council.

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Abstract

This project utilized a mixed-method needs assessment approach to urban agriculture in Arkansas, a predominately-rural state. Chapter II was a qualitative study, using semi-structured, in-depth interviews, that investigated the perceptions, needs, and experiences of Arkansas urban farmers and their interactions with the University of Arkansas Division of Agriculture Cooperative Extension Service (CES). Interviews were conducted with 16 urban farmers in Northwest and Central Arkansas. The interview data revealed individualized needs based on the size, years in operation, and mission of each urban farmer interviewed. General needs were determined, such as market pricing, co-ops, and access to appropriate equipment, but generally needs varied widely. Participants revealed a positive perception of CES, though explaining that the organization did not always have resources specific to small-scale, sustainable farming, but there is potential for increased collaboration and communication between Arkansas urban farmers and CES. Future research with this population should follow a phenomenological approach in addition to specific needs assessments grouping farmers with similar production methods.

Chapter III was a quantitative survey with Arkansas agricultural County Extension Agents (CEAs) that investigated their perceptions, awareness, and experiences with urban agriculture in their counties. This survey had a 57% response rate. The survey revealed potential barriers for agents to work with urban farmers in their counties, as well as their perceptions and awareness of urban farming. While 89.4% of participants viewed CES as a valuable resource for urban farmers, 70.2% reported concentrations of urban farming in their counties as relatively low or nonexistent. The interviews were conducted only in two regions of the state,; however, the survey questionnaire was distributed to CEAs statewide.

Recommendations for practice include conducting needs assessments with groups not traditionally supported through CES, such as sustainable or alternative agriculture farmers. Additional needs assessments could improve collaboration and relationship building between CES and underserved populations, increasing face-to-face communication that contributes to increased collaboration between both populations. CES should also identify key personnel within their organization who have previously established relationships with urban farmers to market new programs and advertise CES's role in urban agricultural support in their state.

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List of Published Papers

Chapter II:

Dobbins, C. E., Cox, C. K., Edgar, L. E., Graham, D., & Perez, A. P. (in progress). A qualitative needs assessment of Arkansas urban agriculturalists. *To be submitted to the Journal of Agricultural and Extension Education.*

Chapter III:

Dobbins, C. E., Cox, C. K., Edgar, L. E., Graham, D., & Perez, A. P. (in progress). A survey to describe the perceptions of Arkansas agricultural county Extension agents toward urban agriculture. *To be submitted to the Journal of Agricultural Education.*

Chapter I: Introduction

Need for the Study

The origins of urban agriculture in the United States date back to the 1800s and have impacted the nation significantly, such as with the victory gardens of World Wars I and II (Cannon, Kirby, & Morgan, 2019; Reynolds, 2011; Stanko & Naylor, 2018). Urban agriculture has gained popularity in the last decade as a potential solution for environmental concerns and a growing interest in personal health, community building, local food systems, and sustainable city development (Hendrickson & Porth, 2012). Urban agriculture generally refers to “growing and raising food crops and animals in an urban setting for the purpose of feeding local populations” (Goldstein, Bellis, Morse, Myers, & Ura, 2011, p. 4). For years, lower-income countries have relied on urban agriculture as an important food source for the urban poor, which contrasts with the timeline of growing interest in new urban agricultural operations in the U.S. (Rogus & Dimitri, 2014). The impetus for urban farming in the U.S. goes beyond just concerns for food security—it also supports local and regional food system development, food waste reduction, sustainable urban development, and community building (Hendrickson & Porth, 2012; Rogus & Dimitri, 2014).

Many urban agricultural operations differ from conventional agricultural operations in production methods, scale, and other practices based on values such as having a greater focus on organics, sustainability, and food security (Peters, 2010; Rogus & Dimitri, 2014). Urban agriculture aims to address food justice and food security, which may help create greater resiliency in communities (McClintock, 2017) through building community and social capital (Brown & Jameton, 2000; Kopyawattage, Warner, & Roberts, 2018).

Broad definitions of small farms exist, with the definition context primarily differing by references to gross income or acreage. The United States Department of Agriculture’s (USDA)

Census of Agriculture 2012 provided a breakdown of farm operations in the U.S.— 8% of farms were 1,000 acres or larger; 25% of farms were 180 to 999 acres; 30% of farms were 50 to 179 acres; 28% of farms were 10 to 49 acres; and 11% of farms were 1 to 9 acres (National Agricultural Statistics Service [NASS], 2014). Another publication based on the same census data stated 88% of the 2.1 million farms in the U.S. were small family farms, grossing less than \$350,000 (NASS, 2016). NASS (2016) reported that 88% of farms in the U.S. are small operations, grossing less than \$350,000 in cash farm income, and small farms account for 48% of farmland nationwide. Of the small farm operations detailed in the 2012 Census of Agriculture, 17% reported organic sales, 58% reported direct-to-consumer sales, and 44% reported receiving government payments (NASS, 2016). Many small farms, though family-owned, contract with large corporations to sell their product(s), and thus may be dependent on agricultural supply chains (Gliessman, 2015). For small farmers, a reduction in or inaccessibility to resources has led to deficient infrastructure and market accessibility (Hamilton, 2015). It is important to increase the availability and presence of voices in alternative food networks to ensure that independent operations can be viable in the marketplace.

Urban farmers may face challenges when trying to access consumers who want to buy their products, such as a lack of marketing and processing infrastructure to usher products to consumers (Rogus & Dimitri, 2014). Urban farmers become dependent on higher prices for long-term viability, which can counter the original mission of creating food resilient communities (Rogus & Dimitri, 2014). Small farmer operators struggle to have their voice heard in the midst of large companies that dominate the market, as the increased corporatism of the U.S. economy and the increasing industrialization of agriculture has not aided these farmers in interacting with influential policy and law leaders (Hamilton, 2015).

Rapid urbanization and the organization's foundation in rural communities challenge Extension to redefine its programming to serve the growing urban population (Harder, Narine, & Wells, 2018). The Cooperative Extension Service (CES) is a strong and available resource for farmers to utilize for help with farm operation challenges, as well as marketing, community development, business management, and much more (Reynolds, 2011). CES is a national system that provides research-based information to the public through the partnerships between the USDA's National Institute of Food and Agriculture (NIFA) and the land-grant universities in each state (NIFA, 2019). The founders of CES intended the organization to assist rural individuals and communities (Webster & Ingram, 2007). Extension programming is effective because it derives its direction from the informational needs of those it serves, though CES has traditionally focused on delivering programs to rural communities (Schaefer, Huegel, & Mazzotti, 1992; Webster & Ingram, 2007).

A gap exists between urban farmers and the Extension service (Reynolds, 2011). CES has traditionally worked with small farms, but the unique characteristics of urban farming merit investigation into urban farmers' specific needs (Hendrickson & Porth, 2012; Rogus & Dimitri, 2014). Several state Extension systems, including Florida and Missouri, have identified the need for development with urban programming in Extension (Harder, Narine, & Wells, 2018), but relatively few states have analyzed urban agriculture and the specific needs of urban farmers (Hendrickson & Porth, 2012). Research to date consists of case studies of different urban farming operations in several states, which highlights some of the aforementioned issues urban farmers face, but limits the contextual understanding of urban agriculture as a whole (Rogus & Dimitri, 2014). Urban agriculture is defined by a unique set of characteristics that separate it from conventional agriculture, including size, relationship to the community, socially conscious

missions, and distinct market engagement relationships; therefore, detailed analysis will allow specific programs to be tailored to fit urban farmers (Rogus & Dimitri, 2014). With the assistance of the Urban Sustainability Directors Network (USDN), Missouri's Extension service developed a report identifying key concerns of urban farmers in metropolitan centers. The USDN, a peer network of municipal government professionals, focuses on bettering environmental quality, economic prosperity, and social equity (Hendrickson & Porth, 2012). Concerns addressed included identifying land use and city ordinances that could support urban agriculture and learning the best food production and safety practices for urban agricultural operations (Hendrickson & Porth, 2012). Rogus and Dimitri (2014) further expanded on issues facing urban farmers, stating urban farmers often lack access to credit, lack access to water, lack municipal support for composting, and face unfriendly regulations regarding zoning, city plans, and building codes.

Furthermore, limited social science research has been conducted analyzing urban agriculture specifically in Arkansas. Arkansas Extension has a thriving Master Gardener program, which is a potential resource for urban farmers, but programming focuses on hobby and community gardening and 4-H programs, not for-profit organizations, and small-scale urban operations (University of Arkansas Division of Agriculture Research and Extension, 2016). The Master Gardener Program consists of horticulturally trained volunteers who disseminate research-based information through educational programs. Urban farmers need programming scaled up from the traditional Master Gardener program model to address the unique production systems utilized (Rogus & Dimitri, 2014). The needs of urban farmers reported in Hendrickson and Porth (2012) included food distribution infrastructure, city ordinances and zoning, access to capital and water, and community involvement. These needs demonstrated the necessity to

identify key concerns for urban farmers, and provided a starting point to investigate the context and needs of urban farmers in a rural state like Arkansas. Understanding urban farmers' needs will allow the state's CES to bridge the gap between non-traditional farmers and County Extension Agents (CEAs). In order to develop urban agricultural programs within Arkansas' CES, it is important to understand the perceptions, awareness, and experiences of the Agriculture CEAs and state Extension specialists who would be implementing these programs and interacting with farmers.

Needs assessments are an important aspect of program planning (Seevers & Graham, 2012). Needs assessments provide Extension educators with the ability to learn more about the present conditions and specific needs of a community by focusing on gaps or deficiencies. Evaluators conduct needs assessments by involving multiple groups concerned with the proposed educational program, including learners, educators, community members, and other stakeholders depending on the context of the situation being evaluated (Seevers & Graham, 2012).

This study bridged gaps between CES and urban agriculture by investigating the social, economic, and environmental conditions that would provide foundations for potential future program development for urban farmers. The qualitative measures implemented in Chapter II helped to identify the research, resources, and training needs desired by urban farmers for potential Extension programming. The quantitative measures implemented in Chapter III described the awareness, understanding, perceptions, motivations and willingness of Arkansas' agricultural CEAs to adapt already-existing programs or to create new programs to be more inclusive of Arkansas' urban farmers.

This study aligns with research priority areas (RPA) in the American Association for Agricultural Education (AAAE) National Research Agenda (Roberts, Harder, & Brashears,

2016). First, it related to Research Priority 4: Meaningful, Engaged Learning in All Environments. This RPA focused on agricultural education at the collegiate level, but non-formal education through Extension is an important aspect of agricultural education programs. This RPA poses the question “How can delivery of educational programs in agriculture continually evolve to meet the needs and interests of students?” (Roberts et al., 2016, p. 39). Students in this case can be defined as any potential recipient of Extension programming, including urban farmers. Another RPA to which this study related is Research Priority 6: Vibrant, Resilient Communities, which included the research priority question, “How do agricultural leadership, education, and communication teaching, research, and extension programs impact local communities?” (Roberts et al., 2016, p. 51). With migration from rural to urban areas due to rapid urbanization, the last decade has seen an increase in urban agriculture (Rogus & Dimitri, 2014). Urban farms are generally involved in the local community, which can potentially help a community become more resilient, especially in regard to food security, which related to another RPA. Research Priority 7: Addressing Complex Problems poses the question, “What methods, models, and programs are effective in preparing people to solve complex, interdisciplinary problems (e.g. climate change, food security, sustainability, water conservation, etc.)?” (Roberts et al., 2016, p. 59). Urban agriculture often “enhances food security...supports the development of local and regional food systems, reduction of food waste, [and] community building” (Rogus & Dimitri, 2014, p. 64) which are all interdisciplinary problems that can be related to this RPA.

A baseline should be formed in order to guide future program development within the urban agriculture sector (Schaefer, Huegel, & Mazzotti, 1992). A needs assessment of urban farmers that identifies the resources and research desired and their primary mode of information acquisition can help achieve this baseline. The Targeting Outcomes of Programs (TOP)

framework guided this study as the baseline assessment aims to guide future program development (Rockwell & Bennett, 2004). The qualitative needs analysis employed in this study can be utilized in future program development and research for the Arkansas Division of Agriculture CES. Many previous Extension studies follow the segregated dichotomy of either surveying employees of the Extension Service (including CEAs) or surveying urban community members (including urban growers). This study aims to fill a gap in the research by identifying the overlaps and the distinctions between the needs of urban farmers and the awareness, perceptions, and experiences of agricultural CEAs about urban agriculture by employing complementary mixed-mode research methods. Emulating previous studies that aimed to quantify the gap between CES and urban farmers, the researcher implemented a two-pronged approach by performing on-site interviews with urban farmers and electronic surveys for CES agents (Reynolds, 2011).

Statement of Problem

Urban agriculture has gained popularity in Arkansas over the past decade. This popularity resulted not only from the farms' production operations, but also from the fact that these farms often served as community development centers by offering workshops, trainings, and visits, providing food security donation spots, and other community activities. Because of the unique nature of urban farming, Arkansas' Division of Agriculture CES has increased focused efforts on interacting with this population, but barriers remain in communicating their role in these efforts to the urban farming population. Since CES was created to serve rural areas, urban farmers and producers are not always aware of the services that are available from this resource, while some are unaware of the organization's existence (Kopiyawattage, Warner, & Roberts, 2018). CES has a mission of improving the welfare of state residents, and now that a large percentage of residents live in or near urban settings, CES should allocate and augment resources to programs

targeting these urban areas, including urban agriculture (Harder, Narine, & Wells, 2018).

Because many urban agricultural operations focus on increasing food security in their local communities, they may become vital resources in future community-building efforts.

Resource allocation and program development in these areas requires a baseline assessment of urban agriculture in Arkansas to understand which programs, research, and trainings would be most beneficial for urban farmers. Many researchers focus on municipal food strategies that are effective solutions to urban food system issues, and urban agriculture is an important focus in these studies (Mansfield & Mendes, 2013). A needs assessment will allow CES to have the information necessary to guide future program development. Hendrickson and Porth (2012) identified the needs of urban farmers in Missouri, and because Arkansas shares regional similarities with this state, one can logically conclude that Arkansas would have similar issues relating to urban agriculture, but there is no research supporting this statement. This study aimed to fill those knowledge gaps.

Arkansas is a predominately rural, conventional agriculture, specifically row crop, state (Strausberg, 1989). With the current shift of growing metropolitan hubs in the state, it is important to identify the perceptions and awareness of CEAs as well as their desire to work with urban farmers and modify current programs to meet the needs of urban farmers. While efforts to connect CES with the urban farming population are currently underway (Perez & McCullough, 2017), especially in the Northwest and Central regions of the state, this study aimed to identify specific need areas and understand comprehensively the perspectives and experiences of urban farmers and agricultural agents in the state to further bridge the gap between these two populations.

Purpose and Objectives

The purpose of this study was to research the needs of urban farmers and to compare demonstrated needs to Arkansas' agricultural CEAs' awareness and perceptions of, and experiences with, urban agriculture. Interviews conducted with Arkansas urban farmers and the statewide survey of agriculture CEAs in Arkansas revealed gaps and alignments between the needs of urban farmers and the resources available through the Cooperative Extension Service. The following research projects accomplished this goal: (1) a qualitative needs analysis of Arkansas urban farmers and (2) a survey to describe Arkansas' agricultural CEAs' awareness and perceptions of urban agriculture.

Chapter II (Article I): A qualitative needs assessment of Arkansas urban farmers.

The purpose of this needs analysis was to assess needs, including training and technical assistance, of urban farmers in Arkansas's urban areas. The following research questions guided the needs assessment:

1. What is the context of urban agriculture in Arkansas?
2. What research and resources would be most beneficial to Arkansas' urban farmers?
3. How can CES serve Arkansas' urban farmers regarding resources, training, and technical assistance?

Chapter III (Article II): A survey to describe the perceptions of Arkansas agricultural county Extension agents toward urban agriculture.

The purpose of the survey was to describe the perceptions, awareness, and abilities of Arkansas' agricultural CEAs in relation to urban agriculture. The following objectives guided this study:

1. Describe CEAs' perceptions of urban agriculture.
2. Determine CEAs' awareness of urban agriculture.

3. Describe CEAs' self-reported ability to advise and assist urban farmers.
4. Determine CEAs' identified barriers and benefits to participating in urban agricultural programs.
5. Determine if responses of CEAs in counties serving predominately metropolitan areas differ significantly from the responses of CEAs in counties serving non-metropolitan areas.

Definition of Terms

Cooperative Extension Service (CES) — “a public-funded, non-formal, educational system that links the education and research resources of the U. S. Department of Agriculture (USDA), land-grant universities, and county administrative units. The basic mission of this system is to help people improve their lives through an educational process that uses scientific knowledge focused on issues and needs” (Seevers & Graham, 2012, p. 254).

County Extension Agent (CEA) — “the Extension educator employed at the local county or parish level. The number of agents per county varies according to community size and support. The agent's primary responsibilities are educator and advisor, and transferring the findings of research and new technology to the solution of problems in the community, farm/ranch, or home. The specific title of this position may vary from state to state with such titles as Farm Agent; County Agent; Agriculture, Home Economics or 4-H Agent; Youth Development Agent; Family and Consumer Science Educator” (Seevers & Graham, 2012, p. 254).

Division of Agriculture — an entity of the University of Arkansas composed of the Agricultural Experiment Station and the Cooperative Extension Service (Hightower, 2017). It offers research, extension, and other programs to all 75 Arkansas counties.

Food System — “all the growing, processing, distributing, retailing, consumption and waste disposal activities associated with food” (Hendrickson & Porth, 2012, p. 6).

Market Gardener — a term used by participants in reference to the work of Eliot Coleman (2018), *The New Organic Grower: A Master’s Manual of Tools and Techniques for the Home and Market Gardener*, and Jean-Martin Fortier (2014), *The Market Gardener: A Successful Grower’s Handbook for Small-Scale Organic Farming*, in reference to their growing practices and producer identity.

Needs Assessment — “a systematic process of analyzing gaps between what learners know and what they should know and do” (Seevers & Graham, 2012, p. 105). Conducting a needs assessment is an important step in program planning (Seevers & Graham, 2012). Methods for collecting data for a needs assessment can include “advisory committees, survey questionnaires, focus groups, interviews with key informants or a combination of methods” (Caravella, 2006, para. 2).

Opinion Leadership — “the degree to which an individual is able to influence informally other individuals attitudes or overt behavior in a desired way with relative frequency” (Rogers, 2003, p. 354).

Program — “refers to the product resulting from all activities in which a professional educator and learner are involved” (Seevers & Graham, 2012, p. 101).

Specialists — “faculty members with expertise and specialized knowledge in a particular subject-matter area. They are involved in translating and disseminating research-based material to county Extension agents and their clientele groups. Specialists usually have a doctoral degree with rank equivalent to the campus professor system” (Seevers & Graham, 2012, p. 260).

Urban Agriculture — “refer[s] to growing and raising food crops and animals in an urban setting for the purpose of feeding local populations. Cities choose to narrow and focus this definition in various ways, often categorizing urban agriculture as one or more of the following: community gardens, commercial gardens, community supported agriculture, farmers’ markets, personal gardens, and urban farms” (Goldstein et al., 2011, p. 4). For this study, the definition of urban agriculture relates to the definition differences between a community garden and a farm, in which “a community garden is meant for home use whereas farm output is intended for the market” (Rogus & Dimitri, 2014, p. 65). McClintock (2012) detailed the most common types of urban agriculture, and the researcher decided on including the non-profit and commercial/for-profit operations as part of the sampling frame in this study due to the market engagement of these operations.

Assumptions

The following assumptions existed in this study:

1. The researcher always read the questions as worded in the interview protocol (Collins, 2003).
2. Participants accurately and reliably provided requested data because it requested recall of past behaviors (Dillman, 2014; Roberts, Murphy, & Edgar, 2010).
3. Participants comprehended survey questions and provided honest responses (Collins, 2003).
4. Wording of survey questions provided the participants with all the necessary information required to answer in the way the researcher intended (Collins, 2003).

5. The survey questions asked for information the participants had and could retrieve (Collins, 2003).

Delimitations

By using an operational definition to recruit participants to the sample, participants in the peri-urban fringe, those living between the urban and rural locations, were eliminated. These individuals may have provided valuable feedback in the interviews.

Limitations

This study was limited by the following:

1. Qualitative research methods have inherent limitations through its position as an interpretive science. Research quality is dependent on the individual researcher's skills, and rigor is more difficult to maintain and demonstrate than in quantitative research (Anderson, 2010). Because qualitative researchers start with observations and use them to induce a theory and sampling numbers remain small, the generalizability of the results is limited (Tuckett, 2004).
2. The interviewed urban farmers were only in two regions of Arkansas (Northwest and Central Arkansas). The farmers were located in cities that are distinct from the majority of Arkansas. Therefore, the generalizability of the results should not extend outside of surveyed regions and the participants of the study. This study intended to guide future statewide urban farmer interviews and surveys to contextualize urban agriculture for the entire state of Arkansas.
3. Snowball sampling methods have inherent limitations. First, conclusions reached in a study using snowball sampling methods can be biased, because respondents might be more inclined to recommend those with similar characteristics to themselves due to their social connections, which would include an over-representation of a certain type

of individuals rather than a representative sample. Second, there is no statistically reliable method of determining saturation for the sample. The definition of saturation is when the sample participants can provide no new information beyond the already interviewed respondents. It is not possible in this circumstance to determine whether new information could have been gleaned if a random sampling method had been used (Sadler, Lee, Lim, & Fullerton, 2010).

4. It is difficult to decide on which definition of urban agriculture to use in a study, because every state's context of urban agriculture is distinct. The researcher attempted to develop an operational definition of urban agriculture based on literature before conducting interviews with urban farmers, which could have unintentionally excluded appropriate urban farmers from the sampling frame.

Reflexivity Statement

As the primary researcher for these studies, I have certain assumptions and biases that may have influenced the project. My personal experiences and studies in the agriculture industry have shaped my views and perceptions of agriculture as a whole. My thoughts, interests, and values have the potential to bias results due to the nature of qualitative research, but it is my responsibility as the investigative researcher to recognize the influences of my personal beliefs so they do not invalidate the data (Krathwohl, 2009). I am a student of agricultural education focusing on Extension education, but my work with food insecure communities led me to this research area of interest.

I have volunteered with urban farms with the organization Seeds that Feed, a food recovery operation in Northwest Arkansas. I have experienced first-hand the impacts these farms have on local communities, especially with increasing food security. I have experience that has

allowed me to understand the uniqueness of urban farming operations that distinguish them from conventional agricultural operations. I appreciate the discipline of agricultural education, but I have an interest in exploring the diverse intersections of agriculture in the modern world as an avenue to solve many global issues, such as hunger and food insecurity. This interest led me to develop a study exploring the potential working relationship between urban farmers and CES.

Institutional Review Board

University of Arkansas policies and federal regulation require research involving human subjects to be submitted, reviewed, and approved prior to research completion. Following this policy, the IRB office of the University of Arkansas approved this study and granted permission to proceed with data collection. The approval numbers for this research project are: 1804115868 for Article I, *A Qualitative Needs Analysis of Arkansas Urban Farmers* (Appendix B) and 1809143362 for Article II, *A Survey to Describe the Perceptions of Arkansas Agriculture County Extension Agents towards Urban Agriculture* (Appendix D).

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Chapter II: A Qualitative Needs Assessment of Arkansas Urban Farmers

Keywords: Urban agriculture, Cooperative Extension Service, Local food, Needs assessment, Food security

Introduction

As the local food movement continues to grow across the country, understanding the context of urban agriculture in a rural state is critical for the success of local food movement actors. The Cooperative Extension Service (CES) in many states is a great potential actor in the transition to local and regional food systems (Dunning, Creamer, Lelekacs, O’Sullivan, Thraves, and Wymore, 2012). Industrial agricultural production is increasingly challenged by producers and consumers integrated into the local food system. Many of those involved with local food systems, particularly urban farmers, view themselves as integral to economic enterprises at the community level working to solve pressing social issues (Lyson 2004).

The idea that urban food environments are a potential solution to urban food security and diet-related disease is increasingly popular (Pettygrove and Ghose 2018). Several factors influence the rising popularity of urban agriculture specifically, including economic crises, recognition of the effects of climate change, increased costs of fuel and food, and a need to reduce food expenditures at the household level (Reynolds 2011). The benefits of urban agriculture range from increased food access to environmental conservation, but urban agricultural operations have unique issues that merit specific attention and programming from CES. Urban agriculture and local food system activities often connect with community-based food activists that seek to provide alternatives to conventional agriculture and its related food system, as well as increase food justice within the community (Pettygrove and Ghose 2018). Other aspects of this community-based food activism include community gardens, farmers’

markets, and community supported agriculture. One reason that urban agriculture provides a potentially effective method of reducing food insecurity for urban communities is that many of these farms operate within neoliberal economic structures, which tend to favor the free market, private property rights, and free trade (Harvey 2005; Pettygrove and Ghose 2018). These economic paradigms allow CES to use knowledge of traditional market structures and consumer bases to help bolster these micro-economies within the urban context. Food activism, generally perceived as politically biased, can work with organizations such as CES to promote these economic development strategies for increasing community resilience to food insecurity (Pettygrove and Ghose 2018). CES identifies as a politically neutral actor, so examining these types of access points into the local food system will help CES build relationships with the local food movement, specifically urban farmers (Clark, Bean, Raja, Loveridge, Freedgood, and Hodgson 2017).

These operations require infrastructure, adequate farmland, and technical expertise to compete in the marketplace with the international food corporations that dominate the global food system (Lyson 2004). While the U.S. Department of Agriculture (USDA) and the land-grant university system that encompasses CES have traditionally worked with and promoted the conventional agricultural model, these organizations are in a unique position to assist with the development of local food systems, though some personnel and state services already do this. As a research entity that can provide beneficial resources to alternative farmers to help bolster their economic and market activity, CES can help communities become resilient to the risks of operating in the local food system (Lyson 2004).

The University of Arkansas' Community and Economic Development Unit of CES participated in a U.S. Department of Agriculture (USDA) partnership to investigate local food

movement efforts (Perez and McCullough 2017). The project included five regional “Local Food Meetups” and assessed local food system efforts and infrastructure, created directories of local food system stakeholders, and identified the needs and challenges in the local-food value chain. The unit defined the needs of producers, direct markets, retail buyers, and institutional buyers, as well as technical support and coordination efforts by region. The project highlighted stages of local food development in different regions of the state and helped contextualize the status of local food system development in Arkansas. However, this project did not target urban agriculture specifically, so CES would benefit from deeper investigation into the needs of Arkansas urban farmers. It is important to understand the types of diversity within urban agriculture and the types of assistance that would be useful to farmers in order to develop programming that targets their needs (Reynolds 2011). Building on the work of Perez and McCullough (2017), this study aimed to increase the understanding of urban agriculture in a largely rural state.

Literature Review

What is urban agriculture?

Defining the local and regional context of urban agriculture is important for many reasons. Researchers need to understand and develop an operational definition so that they can sample from the correct population. The importance of the definition is critical for cities as well. Local food systems and urban agriculture are diverse because they are sensitive to the local context and dependent on the people involved. Cities must understand the context of urban agriculture in their area, which includes defining and clarifying definitions of urban agriculture and food system issues, so city leaders can align codes and ordinances with the needs of the constituents involved in local food as well as provide resources and education to those who need

it (Hendrickson and Porth 2012). Some city governments promote urban agriculture as a pathway for economic development, operating through both the public and private sector to revitalize neighborhoods (Pettygrove and Ghose 2018).

The definition of urban agriculture at the local level is important because the definition can affect the availability of CES' assistance (Reynolds 2011). The lack of clarity impacts CES personnel because it can potentially affect the creation and expansion of urban agricultural programming. This can limit the results of a study because confusion over the operational definition can overtake the dialogue rather than focusing on actual program development. Due to locally mediated accessibility, technical support and educational program development should begin with creating a context-dependent and specific definition of urban agriculture.

Literature provides many definitions of urban agriculture, making it difficult to define as a whole. Nearly every study defines urban agriculture in the specific context relevant to the study's research objectives, which makes finding an all-encompassing definition of urban agriculture quite difficult. Additionally, it is challenging to find an exact definition of urban agriculture because many urban farms are primarily concerned with supporting social goals rather than producing food (Rogus and Dimitri 2014). These social goals include, but are not limited to, community-building, raising food and agricultural literacy, and involving consumers in the local food system. Many operations focus on the local community and its related issues (Hendrickson and Porth 2012).

Some definitions of urban farming refer to growing food crops and raising livestock in an urban setting to feed local populations (Goldstein, Bellis, Morse, Myers, and Ura 2011; Hendrickson and Porth 2012). The USDA cites the University of California for its definition, which includes "production, distribution and marketing of food and other products within the

cores of metropolitan areas and their edges” (University of California, Agriculture and Natural Resources 2019, para. 1). This definition of urban agriculture allows for the inclusion of community gardens, commercial gardens, community-supported agriculture, farmers’ markets, personal gardens, and urban farms. Often, community and personal gardens produce food for home use, while urban farms intend output for market (Rogus and Dimitri 2014). Many urban farmers are small producers who use income from the farm to subsidize their primary form of income, but some operations can be large-scale and have significant market engagement (Hendrickson and Porth 2012). Reynolds (2011) defined urban agriculture as production located in or around urban centers and integrated into the urban economic, social, and ecological system. Urban agriculture can be a food-producing and community-oriented for-profit business, especially as urban agriculture becomes an important sustainable development mechanism (Hendrickson and Porth 2012), while other urban agricultural operations are strictly non-profit. The city of Chicago defined urban agriculture as tied to the market, stating that these farms grow food intending it to be sold in urban centers and the urban fringe (City of Chicago, 2019). These operations can be either nonprofit or commercial, but due to their market engagement, require a business license (Rogus and Dimitri 2014). This definition of urban agriculture aligns more closely to the definition for this study, which was chosen based on the traditional relationships between the CES and small, diversified farms. The development of this operational definition is explained further in the methods section. This diversity is an important and unique aspect of urban agriculture.

Cooperative Extension Service

The Cooperative Extension Service (CES) is a national system that provides research-based information to the public through partnerships between the U.S. Department of Agriculture

(USDA)'s National Institute of Food and Agriculture (NIFA) and the land-grant universities in each state (NIFA n.d.; Seevers and Graham 2012). Traditionally, CES has worked with rural communities and conventional farming operations. When CES began, most U.S. citizens lived in rural communities; however today, most of the population resides in urban and suburban areas (Harms, Presley, Hettiarachchi, and Thien 2013). Because CES programming continually evolves to meet the needs of the public, CES should create new relationships in urban communities to increase accessibility and use of services by an urban audience, though this is difficult due to a limited capacity of time and resources for existing employees (Harms et al. 2013; Harder, Narine, and Wells 2018). Several studies have repeated the identification of the same needs by an urban audience, which allude to systemic challenges within CES that impede its success in the urban environment (Harder et al. 2018). Many stakeholders are involved with the appropriate and efficient allocation of resources to the urban environment, including policy makers and urban service providers, which includes CES. While CES programming and resources are free, the use of these programs, such as the Master Gardener program, requires knowledge of their existence (Varlamoff, Florkowski, Latimer, Braman, and Jordan 2002). Urban residents are one of several key demographic groups that are least likely to be aware of CES and utilize its services (Warner, Christenson, Dillman, and Salant 1996). Because CES is tasked with assisting society with its critical problems, which include families, youth, and the environment, working and creating new relationships with the urban public is essential to successfully solving many pressing societal issues.

Extension agents are uniquely qualified to work as change agents with urban farmers ingrained in the local food system (Clark et al. 2017). Extension plays a significant role in community food system development and can provide resources to address local needs. CES is

embedded in almost every county in the U.S., which makes them key stakeholders with deep relationships that can help bring many resources, including human, technical, social, and financial, to local communities (Clark et al. 2017). CES is becoming increasingly more involved in local food system work, specifically by building upon longstanding relationships with communities, forming new relationships with underserved communities, and examining local priorities (Clark et al. 2017; Perez and McCullough 2017). The engagement with these urban farmers is reciprocal—urban farmers in Northwest and Central Arkansas particularly desire a more robust relationship with CES (Perez and McCullough 2017).

CES personnel envision creating social change through market-centric solutions within the current food system, specifically creating market alternatives that help to reduce inequity for consumers and producers who are part of vulnerable populations (Clark et al. 2017). CES has a history of working toward community change as change agents, but at the same time CES identifies as a politically neutral organization (Clark et al. 2017; Rogers 2003). Thus, market-centered alternative solutions align with the mission of the organization. In lieu of working as social change agents, more immediate solutions for social problems stem from the resources these educators can provide.

Needs assessment

The definition of a needs assessment is “the process of gathering specific information on a focal population or community, setting priorities, and making decisions about the development of a particular Extension program based on the needs identified” (Harms et al. 2013, para. 5). A needs assessment is advantageous because including community input in the early stages of program development helps build relationships at the community level that will be beneficial at the time of program implementation (Webster and Ingram 2007). Methods of data collection for

needs assessments include survey questionnaires, focus groups, or interviews with key informants within the community (Seevers and Graham 2012).

CES personnel should determine successful strategies for assisting urban populations and environments with regard to improving the welfare of individuals and communities (Harder et al. 2018). Since many urban farms have socially minded missions, they can be an efficient conduit for circulating resources to improve local communities. One way to develop these strategies and related goals and objectives is to conduct a baseline assessment of the urban farmers (Schaefer, Huegel, and Mazzotti 1992). This strategy, known as a needs assessment, can help focus strategic planning efforts. A needs assessment that includes a baseline analysis can prevent the termination of a program due to inadequate allocation of funds and lack of impact on the target population. The needs assessment model allows CES to engage with urban farming communities and direct programming to fulfill specific, demonstrated needs.

Theoretical Frameworks

Community Food System Development Framework for Change

Urban agriculture plays an integral role in community food systems. Perez (2016) defined a community food system as a system that “supports farmers and ranchers to sustainably produce a variety of local foods, creates ways to move local foods to the places where we live, learn, work, and play so that we value and have access to healthy, fresh food and clean water in our community” (para. 1). A community food system relates to a wide variety of community concerns and issues because it operates under the structures of environment, policy, capacity, economy, culture, and public health. This framework encourages change towards sustainable food production, harvesting and moving local food, and where food is purchased and consumed.

Community food system change and development occurs through production, coordination, markets, and consumption.

This change framework aims to increase knowledge of food system change opportunities for communities that may not have the current capacity to implement change. It also lays a foundation for planning system changes for local and sustainable production in order to increase access to healthy and fresh food. Individuals, small groups, and planning teams can use this framework to organize stakeholders to think through the change process (Perez 2016). A beneficial aspect of this framework for urban farming as it relates to CES is that the change framework, compiled by CES faculty, allows space for change that is conducive with the operating principles of CES. By framing urban farming in Arkansas with this concept, one can more easily understand many of the aforementioned characteristics of urban farming as they relate to local food movements.

This framework includes five steps for the process of change. The first step is to realize the value of community food system change and development and to identify why a community needs this change. The second step is to describe community qualities, followed by step three, which is to understand the opportunities for changing the community food system. Step four, one of the most critical steps, requires an assessment of current activities focused on developing new change practices. Finally, step five requires a plan for new opportunities to increase access to healthy and fresh foods for the whole community (Perez 2016).

This framework allows for a holistic view of local food movements. As explained previously, urban farmers generally have socially minded missions for their operations. This model demonstrates the complexity of local food and urban farming operations. While this study does not directly utilize the stakeholder groups described in the framework report, it does

identify the key needs of and describes an integral group of local food systems. It builds upon step four of the framework described through a needs assessment with local urban farmers to determine their current practices and needs for change.



Figure 1. The Community Food System Development Model demonstrates the interconnectivity of community dynamics, structures, and social factors. Reprinted from “Community Food System Development Framework for Change” by A. Perez, 2016, University of Arkansas for Medical Sciences: Fay W. Boozman College of Public Health.

Agro-Ecological Educator Theory

The Agro-Ecological Educator (AEE) theory contextualizes the socially minded efforts of many urban farm operations (Wight 2013). This theory “provides a novel interpretation of reality and helps individuals locate, perceive, identify, and name food-related phenomena that affect their lives” (Wight 2013, p. 199). Urban farmers are a unique population with socially driven missions, such as community-based food activism, that generally distinguish them from conventional agricultural operations (Pettygrove and Ghose 2018). The AEE can refer to both

informal educators within the community and educators within CES. This theory stems from the Agronomist Educator theory developed by Paulo Freire (Wight 2013).

Paulo Freire pioneered the Agronomist Educator (AE) theory, which is the parent theory to the Agro-Ecological Educator theory (AEE). Freire was a Brazilian educator and activist who utilized educational frameworks to enact social change and social justice. His seminal work, *Pedagogy of the Oppressed*, builds upon his experiences working in Brazil's Cultural Extension Service to empower low-income communities to have a voice in making life decisions (Freire 1970). The AE theory refers to individuals or groups who use cultural circles "to dialogue with others about the political, economic, and social state of their community" (Wight 2013, p. 203). This theory helps contextualize the sociological motivations behind local food movements, especially as they relate to food security.

Agroecology plays an important role in this framework, because it focuses on alternative methods for sustainable agriculture both in rural and urban areas. Within the AEE theory, people work within cultural circles to engage in dialogue with others about the social, political, and economic aspects of their community, similar to the AE theory (Wight 2013). The AEE theory further develops the agronomist educator by including the paradigm used for challenging oppression and transforming local communities, including food systems. The guiding concepts of AEE are love, dialogical communication, and praxis. Love allows for the integration of humanizing dialogue when discussing politics, religion, development, and food. This construct allows people to see other perspectives and points of view, which is essential to productive dialogue. Dialogical communication helps contributors understand their foundation in the natural world that connects their attitudes towards agricultural practices to their attitudes towards nature, personal values, and religious philosophies. This concept encourages members to talk with others

rather than at others. The final component of this theory is praxis, defined as a cyclical process of dialogue, planning, action, reflection, and evaluation that enables an evolution of the relationship between reality and vision (Wight 2013; Freire 1973; Freire 1970). By framing dialogue within the AEE theory, researchers can better understand their target population and further integrate empathy and rapport into the interview process. This framework helps educators, such as Extension agents, work effectively with communities who prioritize other community issues over agriculture. Building this relationship with members of the community will help CES work effectively with alternative food-production networks (Wight 2013).

Methods

Specialists within the University of Arkansas Division of Agriculture CES faculty have a desire to build relationships with urban farmers but based on CES's traditional foundations dealing with rural and conventional agriculture, they have not developed strong working relationships with this group. The purpose of the assessment was to identify needs of urban farmers in Arkansas' urban centers to inform future program development. The following research questions guided the needs analysis:

- 1) What is the context of urban agriculture in Arkansas?
- 2) What research and resources would be most beneficial to Arkansas' urban farmers?
- 3) How can CES serve Arkansas' urban farmers regarding resource, training, and technical assistance?

To address these three research questions, the researcher implemented the methods as follows.

Developing an operational definition

The researcher developed an operational definition based on definitions of urban farming from Hendrickson and Porth (2012), Rogus and Dimitri (2014), and the City of Chicago (n.d.). The researcher also relied on explanations from McClintock (2012) who described various types of urban agriculture as residential, collective, and institutional, which includes small labor efforts and minimal market engagement. These definitions of non-profit and commercial/for-profit operations indicated frequent, if not total, market engagement. Small community and personal gardens have minimal market engagement and thus have different needs than operations that engage with the market frequently. Due to these distinct needs, CES would assist the operations differently. Assistance for a personal or community garden may focus primarily on small-scale horticultural needs, while an urban farming operation would need more market-based resources. Arkansas is a unique region because most of the state is rural, but there are several urban and metropolitan areas in the state. Many Arkansas farming operations are peri-urban, defined as land outside of city limits or the urban core (Rogus and Dimitri 2014). Some of the peri-urban operations in Arkansas, occurring at the interface of urban and rural areas, parallel conventional farming operations, so the researcher included the criterion of farms being within city limits as part of the operational definition of urban agriculture (Elhadary, Samat, and Oben-Odoom 2013). Other definitions defined urban agriculture as located within the densely settled urban area or the urban fringe (Opitz, Berges, Piorr, and Krikser 2016). Finally, due to the limited land availability within city limits, the researcher determined the operational definition would restrict urban agriculture, in the context of the state of Arkansas, as equal to or fewer than 10 acres (National Agricultural Statistics Service [NASS] 2014). Thus, the operational definition of urban agriculture for this study was a small, diversified farm, fewer than ten acres, located within city

limits that actively engages with the market either through direct-to-consumer sales or through institutional, coordinator, or retail buyers (NASS 2014; Rogus and Dimitri 2014; Opitz et al. 2016; Perez and McCullough 2017).

Context of the study: Arkansas alternative agriculture and local food systems

Currently, the Northwest and Central regions of Arkansas have the greatest local food development in the state (Perez and McCullough 2017). The Local Food Meetups Report, which identified specific challenges faced by each region in Arkansas, explained that Northwest and Central Arkansas are most in need of technical assistance and training to expand current capacity and to assist with value-chain components. The Northeast region of Arkansas has some current local food initiatives but require more support for continued progress and value-chain development. The Southern and Eastern regions are the least developed regarding local food system change and require the most consumer education when it comes to local food and community opportunities related to food development. This report helped establish the status of local food systems in Arkansas. Even though this report does not directly discuss urban farming, several urban farm stakeholders participated in the meetups. This study aims to describe the specific needs of urban farmers to build upon the results of the Local Food Meetups Report.

An inherent limitation to qualitative research is that generalizability is severely limited due to the specific sampling methods and exploratory nature (Tuckett 2004). Even though the qualitative research was conducted in specific areas of Arkansas, many of the identified needs related to the overall needs of urban farmers at the rural-urban interfaces around the U.S. By describing the local food context of this state, the researcher aimed to increase the potential generalizability by the readers of this study to other states with demographics and infrastructure similar to Arkansas.

Participant selection

To recruit urban farmers from Northwest and Central Arkansas to participate in this study, the researcher implemented snowball-sampling methods. Traditional snowball sampling methods start with an individual with desired characteristics recommending future participants based on their social network (Sadler, Lee, Lim, and Fullerton 2010). This multi-stage, semi self-directed recruitment mechanism allowed researchers to reach hidden populations like urban farmers in Arkansas. Specialists within CES have difficulty developing programs focused on urban agriculture because they do not know who these farmers are. This sampling method is advantageous because it provides cultural competence for the researcher and builds trust between the researcher and the potential participants, thereby increasing the likelihood that they will engage in the study (Sadler et al. 2010).

The population for this study included non-profit and for-profit farmers. This change to the operational definition occurred during the sampling process as the role of non-profit farms in Arkansas urban farming became evident in the data. Demographic data for the participants was collected and provides context for those involved in the interview process.

One urban farmer was selected as the “source” for each of the sampling regions. These sources were identified due to the researcher’s personal knowledge of and experience with the urban farming community in each region. Potential participants were contacted via email (or Facebook when no email was available) with a request to participate in the study. Follow-up calls proceeded emails when necessary to improve response rate. When snowball methods resulted in a termination of the sampling chain, the researcher investigated via Google web searches and personal contacts within the sustainable farming community about other urban farms in the area and selected one to start a new chain. This snowball method continued until the

data reached theoretical saturation, or until additional data contributed no new emergent themes, which occurred after the sixteenth interview (Birks and Mills 2015). Participation in this study was voluntary and all participants completed an informed consent document prior to beginning the interview. Interview protocols and informed consent documentation were approved prior to implementation by the University of Arkansas Institutional Review Board (IRB) #1804115868 (Appendix B).

Instrumentation, data collection, and analysis

The researcher selected the interview process to collect data for the needs assessment, as the researcher did not have access to a comprehensive sampling frame of urban farmers (Seevers and Graham 2012). Interview methods appear widely in urban farming research, such as Stanko and Naylor's (2018) interviews with urban farm and city stakeholders, McClintock's (2017) interviews with urban farmers and community organizers, and Pettygrove and Ghose's (2018) interviews with city officials, community organizers, and activists. Many of these interviews analyze urban farming in the context of city green spaces or overall infrastructure. The researcher wanted to use these methods to analyze the needs of urban farmers directly. Interviews allowed participants to insert and elaborate upon new ideas that yielded emergent themes in the data (Denzin and Lincoln 1994; Wilke and Morton 2015).

The constructs in the semi-structured interview protocol related to urban agriculture definitions, descriptions of individual operations, initial interest in urban agriculture, major concerns, information sources, trainings and workshops, perceptions of and experiences with CES, and market engagement. Questions were developed collectively by a committee of social scientists in the Department of Agricultural and Extension Education at the University of Arkansas, specifically one agricultural and extension education student, three professors of

extension education and communication, and one faculty member at the University of Arkansas Division of Agriculture CES who is the state expert for local and regional food systems. Face and content validity were determined by three pilot interviews as well as continued peer review of the protocol. The 16 interviews lasted an average of one hour each, were audio recorded, consisted of 14 open-ended questions, and occurred between August and November of 2018. The interview protocol can be viewed in Appendix A.

Interviews were transcribed then initially coded line-by-line using Microsoft Word, in which data was first open coded (Corbin and Strauss 2008; DeCuir-Gunby, Marshall, and McCulloch 2011). Axial coding followed, where the researcher made connections between codes derived from the open coding process (DeCuir-Gunby et al. 2011). NVivo 11 was used to determine emergent and protocol-derived themes from the data. The researcher utilized the constant comparative method between transcripts, which included theoretical sampling, development of emergent categories, and identification of axial codes that were present in multiple transcripts (Glasser and Strauss 1967).

Two independent reviewers analyzed themes for validity (Lincoln and Guba 1985) through a codebook (DeCuir-Gunby et al. 2011). To increase the inter-rater reliability between coders, the researcher developed a qualitative data analysis codebook in which signal words were determined for each theme and the frequency of references to the themes was calculated for each transcript (Wilke and Morton 2015). This codebook allowed the researcher to quantify the coding of themes that enabled a direct comparison among the coders (MacQueen, McLellan, Kay, and Milstein 1998; Wilke and Morton 2015).

Codes developed through this structural analysis (DeCuir-Gunby et al. 2011) emerged from the raw data (data-driven versus theory-driven) and grew from the project's research goals

and questions, and code development was an iterative process (DeCuir-Gunby et al. 2011; Ryan and Bernard 2003). Codes are “tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study” (Miles and Huberman 1994, p. 56). A codebook, defined by DeCuir-Gunby and colleagues (2011), is “a set of codes, definitions, and examples used as a guide to help analyze interview data” (p. 138). The researcher used data-driven codes to reduce raw data into categories and themes, connect themes across participant narratives, and then determine “in vivo” code names or labels or use labels derived from the words of the participants (DeCuir-Gunby et al. 2011; Glasser and Strauss 1967).

The researcher established trustworthiness based on the recommendations in Lincoln and Guba (1985). To establish credibility, the researcher utilized peer debriefing of the protocol and analysis results to determine any potential bias. The thick description of Arkansas urban agriculture and local food helped to establish transferability. Inquiry audits by external researchers allowed for the establishment of dependability. Finally, the researcher established confirmability through an audit trail and a reflexivity statement.

Results

Interviews were conducted with 16 urban farmers—eight in Northwest Arkansas and eight in Central Arkansas. This study was part of a larger research project (Dobbins, Edgar, Cox, and Edgar 2019; Dobbins, Edgar, Cox, Graham, and Perez 2019). This analysis was guided by the research questions described in the methods section: 1) What is the context of urban agriculture in Arkansas?; 2) What research and resources would be most beneficial to Arkansas’ urban farmers?; and 3) How can CES serve Arkansas’ urban farmers regarding resources, training, and technical assistance? Major themes and subthemes emerged within each general

research question and are discussed below. Structural coding processes detailed above (DeCuir-Gunby et al. 2011) guided the emergence of themes and subthemes.

Demographic information

Interviews were conducted with 18 urban farmers, though two interviews (10 and 15) were conducted with two interviewees simultaneously. These participants, noted as UF 10 or UF 15 respectively throughout the rest of the results, were condensed as one participant’s data and proceeding references to number of participants will use 16. Information regarding the participants’ age, gender, and educational background was collected, in addition to information about their farming operations. Most farmers interviewed in this study had obtained a bachelor’s degree and were male (Table 1). The average age of urban farmers was 35.5, with a range between 24 and 59 years. The average years each farm had been in operation was 14 years, and the average acreage was 1.44 acres, with a range from 0.25 to 5 acres of production.

Demographic characteristics for all 18 participants are reported in Table 1.

Table 1

Demographic Characteristics of Participants

Demographic Characteristics	<i>n</i>	Percentage
Gender		
Male	15	83%
Female	3	17%
Age		
20-29	3	17%
30-39	8	44%
40-49	4	22%
50-59	3	17%
Highest Level of Education Completed		
High School	1	6%
Some College	2	11%
Bachelor's Degree	13	72%
Master's Degree	2	11%

RQ1: What is the context of urban agriculture in Arkansas?

The major themes and subthemes, as well as supporting data, related to this research question emerged from the interview protocol questions inquiring about the participants' path to be an urban farmer, definitions of urban farming, descriptions of their operations, and practices used on their operations. One overarching theme related to the context of urban agriculture in Arkansas that emerged from the data was *sustainable practices*. All participants described some degree of sustainable practices on their operations. This theme encompassed descriptions of practices used on farm that differ from conventional methods and relate to agroecological methods:

So we are minimum tillage in some areas, no till, but other than that, I would say that we're just using the principles of organic farming, we're rotating crops were using local compost from the municipality that is a combination of wood chips and leaf mold that has decayed. And we use that in combination with some minerals and some foliar nitrogen products that we use to feed the plants. But other than that, that's really our production model. And we're in soil, so we're using, we're building soil by applying those mulches, the compost and also cover cropping. (UF 3)

We don't use any synthetic chemicals, pesticides, herbicides, or any-cides that are synthetic. We are not certified organic, but we use those practices. Our method of growing is probably most similar to Eliot Coleman, Jean-Martin, and ... let's see, Gardener's Workshop. (UF 9)

All participants indicated to some degree the use of sustainable practices on their operation, and most farmers indicated specifically that they use organic-type practices, whether certified or not, to cultivate their crops (Table 2).

Table 2

Top Five Sustainable Practices Used by Participants

Practice	<i>n</i>	Percentage
Organic-type (certified or non-certified)	15	94%
Minimal/no-till	8	50%
Chemical-free	7	44%
Permaculture	6	38%
Cover crops	5	31%

Other sustainable practices included plants for pollinators, crop rotation, composting, and companion planting. These sustainable practices related to the types of certifications, permits, and licenses acquired by urban farmers in Arkansas (Table 3).

Table 3

Certifications, Permits, and Licenses Held by Participants

Certification, Permit, or License	<i>n</i>	Percentage
Certified Naturally Grown (CNG)	5	31%
Food Safety Modernization Act (FSMA)/Good Agricultural Practices (GAP)	4	25%
USDA Certified Organic	1	6%

Several farmers indicated they chose not to acquire USDA Certified Organic certification because they could not afford it due to the size of their operation, or due to being a non-profit and not engaged in the market, and the benefits would not outweigh the costs (UF 2, 4, 13, 16).

Additionally, no one in the state of Arkansas can conduct the certification—the closest certification program is in Oklahoma—and this was identified as a barrier for some of these small farms. Participants tended to prefer CNG certification, which is a peer-reviewed certification, because it is easier and cheaper to obtain. Similarly, several farmers stated they were familiar with the FSMA/GAP trainings and certifications but were not large enough yet for the laws and policies to apply with them, even though most followed the guidelines (UF 3, 8, 11).

The interview protocol inquired about the types of crops produced by each participant. These results (Table 4) supported the inclusion of diversified farming in the regional definition of Arkansas urban farming.

Table 4

Top Five Crops Produced by Participants

Product	Description	Frequency
Greens	Microgreens, Kale, Spinach, Chard	22
Fruit	Strawberries, Cherries, Apples, Persimmon, Pears, Peaches, Figs	16
Squash/ Zucchini		9
Flowers		8
Peppers		8

Several participants did not produce or sell value-added products, but of those who did, these products included flower bouquets, honey, jams or jellies, and packaged lettuce/microgreen mixes (UF 2, 6, 7, 9, 11).

Descriptions of the various types of market engagement for each operation identified the mechanisms through which participants distributed their products. As the interview process evolved to expand urban farming to include market engagement as well as community engagement, the product recipient list increased and diversified (Table 5).

Table 5

Top Six Recipients of Participants' Products

Customer Type	<i>n</i>	Percentage
Restaurants	11	61%
On-Farm Sales/ Individuals	9	50%
Farmers' Market	8	44%
CSA	5	28%
Donations to Patrons/ Food Pantry/ Hunger Relief Organizations	6	33%
Grocery Stores	3	17%

Based on interview questions about definitions of urban agriculture and descriptions of the interviewees' operations, a local definition of urban agriculture, different from the operational definition, was developed for Arkansas as small-scale, fewer than ten acres, diversified farming within city limits that engages with the market, the community, or both.

Participants indicated that their farms served a variety of purposes, as one participant explained:

So I would say we're trying to be a productive urban farm, make money, but also we really want to connect with the community. So as far as offering educational workshops or events, anything we can do to get people onto the farm and to kind of learn more about sustainable agriculture is our goal...Maybe like growing food but also interacting with the community, as far as education and workshops. (UF 2)

Other participants described farming with non-traditional methods in a rural state, such as when one participant responded to a question about their perception of urban agriculture:

Urban agriculture, I feel like is a big thing that can be... what I automatically think of when I think urban agriculture is people farming in lots in big cities and on rooftops and things like that. But I'm actually running a farm that's within technically city limits, so I'm doing urban agriculture as well. (UF 13)

Becoming an urban farmer

The following themes and subthemes emerged during analysis of data relating how participants became involved with urban farming: *previous interest and experiences*, *education*, and *food security*. The number of participants whose responses contributed to an emergent theme are listed in Table 6.

Table 6

Emergent Themes Related to Becoming an Urban Farmer

Theme	<i>n</i>	Percentage
Previous Interest and Experiences	13	72%
Education	8	44%
Food Security	5	28%

The theme of *previous interest and experiences* demonstrated that participants were influenced by previous jobs, positions, and experiences to begin involvement with urban agriculture. This theme included concepts such as volunteer work, farming on the side, internships and jobs, and childhood farming experiences. Some participants described how volunteering brought them to urban agriculture:

That summer really got me into digging in the dirt and [agriculture], and so came back. Started volunteering, and it was an addiction ever since. Volunteered throughout undergrad. I graduated, I still came back every so often to help, give tips, yada yada. (UF 4)

Other participants had grown up on farms, or had previous agricultural experiences, that led them back to working in agriculture. Other participants also indicated that previous jobs and internships led them to their current occupation, such as when UF 8 stated:

I grew up on a farm [...]. Grew up gardening with my mom and my grandma, and I studied English and Art History in college [...] and then I went to work with [local farm nonprofit], after college, [...] and I interned in the organic garden out there. (UF 8)

The theme of *education* included a desire for self-efficacy, community engagement, and non-formal teaching experiences. This theme was referenced by eight participants (Table 6) and was a strong motivating factor for urban farmers either to begin farming or to incorporate various community engagement activities in their farm programs and activities. One participant stated, “I’m really interested in the education aspect. Having workshops, being able to connect with the community in that respect. Urban was the way to go” (UF 2). Another participant expressed how self-efficacy led him or her to become involved with urban agriculture. This participant referenced this self-efficacy, which influenced many educational aspects on their operation:

We all have this core American thing of wanting to be self-sufficient and know and grow and be independent. [...]. And you wouldn’t think necessarily. I mean, I think historically and culturally where, put in situations that it will seem to have us in such strided oppositional perspectives but the reality is, I mean, beyond that, we do have common interests. Urban and rural, but African American. To all minorities, we want to be self-sufficient in what we do. Now, getting to how do we do that effectively? How do we make those connections? (UF 6)

The theme of *food security* included community issues of food insecurity as well as increasing access to healthy, local food for community members. This theme was referenced by five participants (Table 6). One participant indicated food insecurity as the primary motivating factor for them to begin farming:

Food insecurity in Arkansas is an embarrassment to an agricultural state, or at least it should be. And mostly one in four children are food insecure and obese. We're number one in the country in both of those when I started. (UF 1)

Other participants referenced an inability to afford healthy food and decreased access to land for growing their own food. UF 6 expressed, "I have a group of 20's and 30 somethings [...] that are interested in growing and eating healthier, and they can't afford to come up here to Whole Foods." One participant also stated:

As a historian, I've studied food throughout the history and with the rise of refrigeration, we basically lost the ability to grow food for ourselves. We hit what is an artisan gap. Everybody had to know how to grow food at some point to survive and with the rise of grocery stores and refrigeration we just ... It became convenient and we don't know how to do that anymore. I see people, their health suffering so bad because they're eating out of boxes and windows, and they just suffer. I guess that's why I'm here, to show people what real food is and how to grow it for themselves. (UF 11)

When asked about their previous agricultural experiences, participants demonstrated a wide variety of responses, but few indicated that they had a traditional agricultural background. UF 8 and UF 14 indicated that they grew up on a farm or that their family had a farm when they were younger. Only one participant (UF 16) stated they participated in FFA in high school, and only one participant (UF 6) indicated that they participated in 4-H. Several participants (UF 1, 7, 10) indicated that they had no previous agriculture experience, but they did have gardening experience, such as when UF 7 stated "my mom [had] a little tiny garden, but no, definitely not farming." UF 10 also stated "not really, no, I mean, I was just in my dad's garden, basically. Just like gardening." Only one participant expressed that they had absolutely no agricultural experiences prior to being at their current operation, stating that "I had zero farming. I didn't even have any gardening experience before I was 26 [years old]." (UF 12)

Five participants indicated that they participated in GardenCorps, a program of AmeriCorps and five indicated they either had volunteered previously or completed an internship. Five participants related their collegiate degree to agricultural experiences.

When questioned about whether they define themselves as urban farmers, participants had various answers. Out of the 16 interviews, 12 participants indicated that they considered themselves urban farmers. One participant expressed, “Yes. It’s so kind of surreal, but yes.” (UF 2). Another participant explained how their operation was an urban farm even when their city is not often considered urban:

Yes. Well, I mean we are in the heart of [city] even though [city] is not, I mean it’s hard to, you don’t necessarily think of [city] and the word urban as being synonymous. [City] is more of a town, like a little town, but I think a lot of people think urban farming and they’re thinking an empty lot in the downtown area, high rises and larger structures and buildings all around, but this is definitely an urban area. I mean, we’re in the middle of a huge neighborhood, large concentration of people all around us and we bring kids in from local schools, so we’re absolutely an urban farm. (UF 8)

Another participant further contextualized urban farming definitions within their operation—“Yeah [...] it’s within city limits in a populated area and like with [...] the raised beds we have here, it’s non-traditional because it’s on a pavement, asphalt, parking lot that we just built the beds on.” (UF 16)

Of the 12 participants that indicated they identified with the term urban farmer, four participants (UF 9, 12, 13, 15) further delineated their definition of their profession to include the term “market gardener” (Coleman 2018; Fortier 2014). UF 13 stated, “I run a third of an acre nonprofit fruit and vegetable production farm, so it’s very much a market garden.” Other participants represented the market gardener term, such as:

For the last two years, we’ve been just about 90% market garden...then we’ve got all sorts of little hippie people that are doing

market gardens up there that are coming into market now and whatnot... We see this as just a huge trend; the market gardening and healthier food and local food...We just don't have the land to ever be that but there's a real niche for the market gardener, maybe more so than not. It's just like Curtis [Stone] always said, 'Hundred little market gardeners equals at least to one big commercial gardeners at some point.' it adds up. (UF 15)

Four participants (UF 3, 5, 10, 14) indicated that they did not identify with the term urban farmer, stating that they preferred the terms "producer" or "gardener" rather than "farmer". UF 3 stated "I think I consider myself a producer." UF 5 expressed "No I [don't] consider myself an urban farmer, maybe more like [a] gardener. I don't know, when I think of farmer I just think of bigger scale." Two other participants expressed similar sentiments regarding the term urban farmer. UF 14 stated, "I'm not an urban farmer. I guess probably local farmer would be the word I'd use." Another participant expressed:

Yeah, not really... Yeah, I guess here it's a little weird, I mean, I would consider myself that at my past jobs, but here it, I mean it's like we're in a city but we're on such a big piece of property that it doesn't necessarily feel like we're in a city... ' started out as a farmer at home, out in the country, so for me, that's just what I've been." (UF 10)

RQ2: What research and resources would be most beneficial to Arkansas' urban farmers?

The major theme and subthemes that emerged relating to this research question were identified based on responses to interview protocol questions about the major needs and concerns of the participants relating to their operations. Major concerns of participants included accessing information about market pricing, sustainable and organic pest management, and creating contractual relationships with buyers in the area, but mostly urban farming needs were diverse and varied based on size, mission, and years of operation.

The major themes relating to this research question derived from data-driven and theory-driven structural analysis (DeCuir-Gunby et al. 2011) were *best practices*, *production systems*, *issues with city, policy, and zoning*, and *resources*. Each theme is discussed below.

Best practices

This theme comprised a wide variety of responses. Table 7 provides descriptions of the theme and subthemes and examples of some of the participants' responses.

Table 7

Descriptions and Examples of Best Practices Theme

Code/Theme	Subtheme	Description	Example
Best Practices		Issues relating to how best to farm on small-scale, organic-type operations	“I think maybe best practices for developing co-ops, or farmer to farmer business arrangements, especially in relation to wholesale contracts or special events.” (UF 4)
	Cultivation Practices	Includes needs for knowing the most effective and efficient methods for cultivation in small-scale, organic-type farming	“Maybe someone can help me figure out a better way to slightly contour the beds just to help with these instances of erosion, but honestly it's not that big of a deal because I've only had erosion issues after one or two torrential rains each year.” (UF 8)
	Markets	Includes wholesale	“Marketing. Not really marketing, but a market ... It seemed for me from an outside perspective that there were people who would buy my products. It's not that easy.” (UF 12)
	Networking	Issues related to social needs and networking for farmers	“Having those organized social gatherings, which I personally find really valuable [...] and just meeting other farmers, talking to other folks who are doing Ag in various senses, it's important.” (UF 4)

Many of the quotations within this theme were operation-specific. For example, UF 8 mentioned that they needed help figuring out “a better way to slightly contour the beds just to help with [...] instances of erosion.” UF 4 expressed that they would like assistance related to “season extension”. These are examples of the best practices for cultivation, or cultivation practices, desired by participants. One participant expressed another example of this subtheme:

You can only push lands so far and so hard. And vegetables is actually one of the hardest things on land, it will wear land out very quickly if you don't ever give it time to regenerate. So as you observed in our field, our back, we're taking some time off of production and I think next year, this entire area out front and I think we're going to put it all in cover crops and just build the soil back. And we might even take two seasons to do that, to give it a rest... I would be very interested in someone doing research related to the specifics on fertility, like soil fertility, how long can land give if it's taken care of properly? [...] We're space limited. At the end of the day that's [...] the challenge of urban agriculture. We are going to come up with creative ways of optimizing our space, but the reality is that land needs to rest at a certain point [...] For a small operation to take out half of your production space, that's a disadvantage of urban farming. (UF 3)

Another expressed a similar issue related to growing on the land:

Getting the soil warmed up. Yeah, this spot or this type of terrain isn't really very conducive to vegetable growing. So I think it's a lot harder than where I live is down almost in the Delta, and there it's like, you can dig clear down to the center of the earth if you wanted to and not hit rock, and it's just like so much easier than it is here, here it's like every small thing is a challenge [...]. (UF 10)

Another issue that arose relating to best practices was dealing with pests and disease. One participant stated:

Since we're Certified Naturally Grown, I don't use any pesticides, herbicides or synthetic fertilizers, so what waste I do see is kind of from that stuff. That's always a concern, trying to figure out how I can lose less crops to disease and pests. Less of a concern and more of a passion to try to figure out how to work around this stuff without using chemicals. (UF 7)

One of the most often mentioned issues dealt with markets and wholesale contracts (UF1, 2, 4, 6, 7, 12, 15). UF 4 also stated they would like information on "best practices [for] marketing [...] at farmers' markets". One participant stated that they would like information about establishing pricing:

Well I would like to know what is the pricing? What is speedier methods of delivery? Is it sold by weight? Is it sold by quantity? If

there are differences it would be nice to have a handbook on that type of marketing. I could go and make a relationship with someone, but how should I deliver parsnip? How should I deliver peppers? What should they look like? What kind of quality standards? If they are seconds, what are the prices for seconds? What should we demand for our product[...] You go to look these things up, and that is a real hard thing to research. The USDA shows average prices, but what if you're chemical free? Should you have a premium? [...] But that's the kind of things that we come into this and we had no idea. Go to the grocer and say, "What do you think for this?" Go to the restaurant and say, "What do you pay for this?" And I think there's an expectation for a premium. Or if they have to pay a bit more to get it local and even fresher than they can out of the truck, what is it? (UF 1)

Other participants expressed a desire for information regarding market pricing, such as new markets:

We're always looking for new markets [...city] is a growing local food community, and I feel like we can produce a lot more than we are[,] and the reason we don't is because we don't have a market for them. (UF 2)

Another participant expressed a similar issue with market outlets and how they have worked to overcome it:

I've been working really hard on creating more outlets and markets for my produce, and so I started a CSA program years ago, and I just started it back up two weeks ago after we got reestablished, so that was a great way to know, "Hey, I have customers that have already paid in advance. This food is going right to them." Where you go to the Farmer's Market and it might rain or [...] something, and so your sales are way down even though you've got a table full of food. (UF 7)

Alternatively, UF 15 stated "the only thing that's keeping us from pursuing other markets is we can't grow enough [...] we sell almost everything we grow". They expressed interest in information about:

What kind of market would fit what kind form, because whether you grow for the farmers' market, which you're going to grow a lot of varieties for, versus a potential commercial market where you just

maybe need five or six big varieties of a lot of volume. That's real critical. (UF 15)

There was also a demonstrated a need for wholesale markets:

I've started to, in the last couple of years, go into more wholesale. More volume, less cost, but it all goes. For me, it's like, "Yeah, I'd rather take a little bit less to know everything I just harvested today is gone," rather than a higher price, sitting at the market and only 60% moves. Really, if you sell all of it wholesale, you pretty much make the exact same money if you sold 60 or 50, 70% retail.... Just general information about clients who might be interested in our products. Where they are, how much volume that they need; what kind of prices they're used to paying. (UF 7)

UF 4 expressed that they would like "getting consistent contracts as opposed to going to the farmers' market and praying". One participant stated that "a current problem we have is just trying to find [...] what wholesale prices [are] for selling to restaurants or what a decent retail price is" (UF 10). Marketing to restaurants and securing contracts was described as a stressor for several participants (UF 12, 11, 15). One participant stated:

As a farmer, being reassured that you know that you're going to be able to sell your product or get it to a place takes a lot of stress off of you. If you could, say, get a contract with an organization or a restaurant, for instance, that says, 'We're buying all of your tomatoes and we expect X amount of tomatoes per week.' Just a straightforward contract like that or I can estimate I'm going to get 40 pounds of tomatoes out of this high tunnel each week. If I know I have a guarantee restaurant or other purveyor that's going to take those 40 pounds, it's so much weight off your shoulders and stuff. (UF 11).

Additionally, participants referenced a necessity for knowing specific opportunities relating to marketing:

Pricing is always good, and things like that. Specific opportunities, it's like one thing to have like a workshop on selling wholesale, but if there's not really like that opportunity then it wouldn't make a whole lot sense. (UF 14)

Production systems

The theme of *production systems* was the largest emergent theme. This theme related to issues regarding production on a small-scale, organic-type farm. The issues ranged from growing the business, maintaining a workforce, acquiring and maintaining funding, being a non-profit, involving the community, and maintaining a sustainable operation (Table 8).

Table 8

Descriptions and Examples of Production Systems Theme

Code/Theme	Subtheme	Description	Example
Production Systems		Issues related to small-scale, organic-type production systems	“How do you grow the business when the way we farm and what we farm and how it's done is small-scale and not super profitable? It's not highly profitable. You have a perishable product that you have to move every couple of days, or else you make no money off of efforts that you put months into. It's definitely a challenge.” (UF 7)
	Workforce	Issues related to volunteers and employees	“So mostly it's just myself and my family and then we do pay about 10 hours a week worth of labor.” (UF 9)
	Funding	Includes grants and loans for startup and non-profit costs	“I had tried to take out a small loan to increase my area that I was going to be growing in, and went through the whole process through the FSA, and when it came time for the loan signing they told me that I would have to give everything that I earned until the loan was paid off. I can't live like that.” (UF 10)
	Non-Profit	Issues related to being a small-scale, organic-type non-profit farming operation	“How do I, you know, things like connecting with companies as a nonprofit and that sort of thing. I'd like to see more of that.” (UF 6)
	Community Involvement	Includes involving the community through educational programs or volunteering	“Kind of involvement of the community, spurring interests in people and people not seeing gardening and growing and having reasonably healthy food as not, you know, something that's so prohibitive that they can't do.” (UF 6)
	Sustainability of Operation	Issues related to farmer health, operational sustainability, and the physical challenges of being a farmer	“That's my biggest concern, is if I get hurt, because I do all of this by myself.” (UF 7)
	Money	Issues related to profits from small-scale, organic-type operations	“I certainly don't feel comfortable quitting my job or encouraging someone to quit a day job. Even though there's an opportunity and they might be great at doing it, just because there's a lot of stability with their jobs, and the cost of healthcare is also to the point where it would be prohibitive, I think there.” (UF 14)

One major issue within this theme was the maintenance of a workforce (UF 6, 7, 9, 11, 13). This includes both employees and volunteers. For example, one participant explained:

Expansion is another [issue]. I know it sounds kind of counterintuitive. But we have the ability to farm on a bigger area that we have the ability to afford staff for. I'm the only one on staff for the garden right now [...]It's a full-time and a part-time person I usually lose because of the time of the year, and so then you've got to do it all yourself. (UF 13)

One participant furthered this subtheme when they discussed the difficulty of hiring employees to work on the farm:

If I hire somebody, then we have to just basically grow more food just to pay for them. I basically can keep up and make a good salary based on my labor. As soon as I bring somebody else to the mix, and they don't work as hard as I do, because they're getting \$10 an hour. (UF 7)

Several participants expressed the difficulty with volunteer retention, something they relied on for on-farm labor in both for-profit and non-profit farms (UF 6, 11, 13). As one participant noted, "I'm the only one on staff right now, and volunteers are kind of hit and miss" (UF 13). Another participant stated, "I don't have a lot of long-term retention in volunteers. I mean, I have a few that are strong and steady, but not very many. It's like every quarter you have to rebuild the base." (UF 11)

UF 13 stated that "grants aren't going to pay me to have six people running this farm [and] grants don't pay for my salary". This issue with the workforce also alludes to another subtheme: *funding*. This subtheme included issues for several non-profit farms. UF 1 indicated that they have had issues with grant proposal approval in the past. One participant described the process of trying to get a loan for operational costs:

I had tried to take out a small loan to increase my area that I was going to be growing in, and went through the whole process through the FSA, and when it came time for the loan signing they told me

that I would have to give everything that I earned until the loan was paid off. I can't live like that. And the reason why it's set up that way is because it's set up for row croppers who harvest everything all at once, sell it, and then pay off all their loans. Well that works for them. (UF 10)

UF 4 cited consistent funding was an issue for their operation. One participant indicated that they too relied on grants for their operational costs—"if it wasn't for those grants, [...] funding would have been an issue" (UF 16).

Another subtheme that emerged and relates to the subtheme of funding was non-profits (UF 1, 4, 6, 8, 13). This subtheme is distinct from funding because it discussed operational obstacles of being a non-profit beyond just operational costs and funding. UF 1 stated that being a non-profit "is just the biggest hurdle—grants, [...] where we fall [...as] a non-profit or a farm". One participant expressed:

I know that information is there [about connecting with companies as a non-profit] as I get more exposure or something here to being in a nonprofit sector, along that line, but to encourage urban agriculture and, you know, resources to stay in tune with the trends or something here of the industry, a little bit better. (UF 6)

The subtheme of community involvement included quotations about involving the community through educational programs on the farm, volunteering, or patronage (UF 4, 6, 16). Some expressed issues with patronage on their operation:

Patrons in general [are] very hit or miss. One program, or one work day we may have 15 people come out. The next program, same format, could have one person come out. (UF 4)

One participant expressed a similar issue with community involvement on the farm. They stated that a challenge they have is "recruiting participants":

There's a lot of people that like the idea [...] but don't come out and take full advantage of it. [...] I've tried to reach out to our garden participants to see what they would like to see different in the gardens and [what changes they would like to see.] [I would like]

access to [information about] successful community gardens and the different barriers that they overcame and the things they changed to make it more suitable for the people they serve. (UF 16)

The subtheme sustainability of the operation covered topics of health and the longevity of the operation (UF 7, 14, 13). UF 13 stated that their biggest concern was “getting hurt, because I do all of this by myself [...] it’s a one-person operation [...] if I get injured [...] it all falls apart”.

Another participant echoed this sentiment:

Farming [...] hurts. It’s stressful. If you’re not paying attention you get wrapped up in it, so if you don’t force yourself to pay yourself a certain paycheck, if you’re just starting off and it’s the first three years, or if you aren’t able to set a maximum number of hours you work. If you don’t tell yourself, ‘I’m only going to work 40 hours a week,’ then you just get wrapped up in it, especially during the growing season. (UF 4)

Yet another participant expressed concern over the sustainability of their operation when they stated:

If I leave, how will it do? Because you build something like this... I have a background where I can do a lot of stuff myself. Like all the irrigation work. I built the greenhouse that we have, with a group of volunteers. Not everybody has a lot of those [...] So there’s a lot of other... it’s not just farming, and so I think that’s one of the big concerns [...] because you really can’t find a farmer very easily. [...] I think that’s probably one of the biggest concerns I think a lot of farms have. Not just my farm, not just nonprofit farms. But like when the person running this farm no longer is able to run this farm or wants to run this farm, is there even anybody to come in and take over? (UF 13)

Issues with city, policy, and zoning

This theme includes issues related to farming in public, residential, and city spaces (UF 1, 2, 6, 8, 11).

Table 9

Descriptions and Examples of Issues with City, Policy, and Zoning Theme

Code/Theme	Description	Example
Issues with City, Policy, and Zoning	Includes issues related to farming in public, residential, and city spaces	“We haven’t really had a problem with this yet, but I’m always anticipating someday we’ll have a problem with the city, because, currently we’re not zoned agricultural. This is residential zoning, so ... I don’t know. I mean, if we want to expand, or if we want to have an on-site farm stand, selling produce here on-site, I hope we can work something out with the city to where that’s possible.” (UF 2)

One participant summed up these issues with their statement, “I would rephrase that as the greatest challenge is just being in a public space and dealing with just being in partnership with the city, there’s a lot more regulations” (UF 8).

Some participants cited issues farming in public spaces, such as two farmers whose operations were located in city-owned property (UF 4, 8). UF 11 expressed their greatest concern as “public access to the garden [...which] poses food safety concerns [...] sometimes the public can get a little handsy and that always gets on my nerves.” Another participant had issues with “city folks [...] knocking over my spigots” (UF 6). One participant cited issues with city policy preventing them for two years from having chickens on their operation (UF 1). One participant described problems getting a CNG certification in a city, “[where] people do spray around here, like landscaping companies” (UF 2).

Resources

This theme was semi-emergent as participants were asked about resources that would be helpful to them and their operation. Table 10 provides a description of the theme and subtheme and examples for each.

Table 10

Descriptions and Examples of Resources Theme

Code/Theme	Subtheme	Description	Example
Resources		Includes needed supplies for small-scale, organic-type farming	“Another problem that I’ve had is getting a good resource for supplies, farm supplies. So, I’m talking about organic soil, organic compost, organic straw, chicken manure, tools and implements. Pretty much everything I order, I have to order online or drive forever to get them. So it’s either, when I buy stuff online, I pay tons in shipping, or when I drive across the state to get stuff, I pay in my time. There’s not a good resource for small organic farms here.” (UF 2)
	Co-ops	Includes needs for resource sharing through a local cooperative	“One of the major things in flower farming is the idea of co-ops” (UF 4)

Several participants expressed frustration over issues with finding affordable and appropriate resources and equipment for small-scale organic-type farming, such as UF 2’s statement in Table 10. One participant stated:

I think when urban farmers are needing resources such as straw and animal waste like rabbit manure to support their farms, that there could be some connection [with rural farms]. There could be some details out there of the farms and the resources that they might sell. [...] Like to have a regional [...] booklet update. Hey you’ve got straw. You put it out there in the newsletter that there’s straw available. And that will help advertise and move products. And that’s creating a local economy, because local farmers, urban farmers, rural farmers may need that straw. (UF 1)

One participant expressed a similar concept when they said, “farm stores and farm supply stores are kind of hit or miss, especially going with organic or small scale” (UF 4). They added,

“if you’re super small scale and you don’t have a tax ID number [...] you have to pay retail rates [at most] farm stores or garden centers”.

Other participants stated specific resource and supply needs that were operation-specific, such as when UF 10 said they needed a tractor. UF 6 stated a need for “updated equipment [...] I need [some] battery-operated weed whackers.” One participant furthered this concept with their statement:

Yeah, if we had a decent innovative tool sharing program [...] that would be a huge help. If I could try out some of the tools that I’m interested in buying that are at high cost before I buy them that would be a huge help. (UF 9)

This quotation introduces another concept referenced by multiple participants: co-ops (UF 2, 4, 6, 9, 10). UF 2 stated, “we need a farm co-op that caters to small farms”. UF 10 also expressed interest in accessing equipment through a cooperative.

RQ 3: How can CES serve Arkansas’ urban farmers regarding resources, training, and technical assistance?

Themes that emerged from the data and were derived from protocol questions relating to this research questions were *reputation of CES, points of contact, trainings and workshops, and opportunities*.

Reputation of CES

This theme included descriptions of perceptions and experiences with Arkansas Division of Agriculture CES personnel. All interviewees had previous interactions with CES, to varying degrees, and rated CES as a resource for urban farmers on average 3.2 out of 5, with 1 being not at all helpful, and 5 being very helpful. This theme included two subthemes: weaknesses and successes (Table 11).

Table 11

Descriptions and Examples of Reputation of CES Theme

Code/Theme	Subtheme	Description	Example
Reputation of CES		Includes perceptions and experiences with Arkansas CES	“It’s been a positive experience. What limited amount of experience I’ve had, I’d say [CES is] real open, real excited about sharing their information.” (UF 7)
	Successes	Includes successful experiences or interactions with CES personnel	“There’s a woman at the [state] office [and] she’s awesome. She’s making things happen.” (UF 4)
	Weaknesses	Includes areas of weakness for Arkansas CES identified by participants	“There are other states that [are] way more progressive or diverse in what they understand and teach. [Arkansas CES] is mostly row crop.” (UF 9)

Successes.

Generally, participants had positive perceptions of and experiences with CES (UF 2, 4, 5, 7, 8, 9, and 11). UF 4 stated, “Everyone I’ve talked to from the extension service has been awesome. Whenever I’ve gone to a workshop and folks [...] have given talks, or [I’ve] talked with them, great stuff.” Other participants explained, “I [like] it because I can go in there and ask [them] any kind of question” (UF 5). UF 11 said, “I think it’s been very good. I mean I would describe it as very helpful, pleasant. I haven’t had an experience where I’ve tried to get something from them and not been able to if that makes any sense.”

Another participant stated that “[CES] is really familiar with where to get supplies, [...] best practices, [...] and a general understanding of the market” (UF 12). Others indicated that

they are “helpful with what they offer” (UF 9). Other participants indicated helpful trainings they had attended that were sponsored by CES and the University, such as the Food Safety Training (UF 2, 11) and berry workshops (UF 5, 7, 8).

Weaknesses.

This theme was represented by several quotations, including a response to a question that asked about their experiences with CES—“very friendly but not equipped to help with organic production information, maybe under equipped, I don't know. It's always quite pleasant” (UF 3). Many other participants also expressed their perception that CES did not have many resources for small-scale, organic-type farming, such as when one participant stated:

I still feel like Cooperative Extension is more focused on big ag, and non-organic. And so, if I had a question, mine would be like, small-scale, diversified, sustainable, organic farming question. I just don't feel like they would be my number one person to reach out to. ...And I know that they're working to remedy that [...] I guess I don't have a lot of experience with the Extension service[,] just because I haven't really wanted to. (UF 2)

One participant explained their perception of CES as:

It appears to me that most of it is geared towards larger scale farming and not small-scale urban or sustainable farming, so I'd say a two, personally. That doesn't mean that I haven't pulled information and applied it to what I'm doing, but rarely do I hear, 'Hey, we're doing this small-scale.' [...] Which, I understand. Most people don't do what we do. There's a lot more larger scale farmers that need that information. [I] pick and pull from that, which is fine. I'm happy to do that. (UF 7)

Even though several participants expressed a lack of resources targeted for their type of operation, they explained that agents are helpful with your questions or that the participants apply information however they can to their operation (UF 3, 4, 7, 11). One participant explained:

Publications, workshops, things like that in general don't really seem geared towards small scale, or organic, or urban, but if you call an agent they're going to get back to you...But given our state as a whole, we're much more of a conventional, large scale [agriculture] state period, so that's where most of the money and funding [is...]. From everything I hear, [CES] is overworked, underfunded, over-stretched, and it keeps getting worse. (UF 4)

One participant explicitly expressed a desire for CES to have “someone focused on sustainable agriculture and not focused on conventional commodity crops” (UF 8). Another participant stated that “our [state CES] is mostly row crop [and] they have knowledge about lawns [but] that's not real helpful to me” (UF 9). In addition to needed resources for small-scale farms, another participant expressed a desire for CES to “reach into minority communities” (UF 6).

Points of contact

The participants described a variety of personal connections to CES and different services with which they have engaged that act as points of contact for CES and this population. Table 12 provides a description and example for this theme.

Table 12

Descriptions and Examples of Points of Contact Theme

Code/Theme	Description	Example
Points of Contact	Includes potential areas of improvement or opportunities to connect with members of this population	“I don't have a lot of [experience with CES] other than soil tests.” (UF 13)

Many participants had gone to CES for soil tests (UF 4, 6, 7, 9, 10, 13, 15). These participants appreciated this service as Arkansas is “one of the few states that has free soil testing” (UF 4). Even with participants who indicated very little experience with CES had

received soil test results from CES, such as UF 9, who stated, “soil samples [are] about the extent [of my experience]”, and UF 10, who said, “most of my interaction with them [is] when I bring a dirt sample in”. — and UF 13 — “I don’t have a lot of [experience with CES] other than soil tests”. This service contributed to positive experiences with CES by participants. UF 15 stated that “I’ve taken numerous soil samples up to them. I’ve gotten really good feedback and results very prompt and fast. I haven’t had to wait just any time for pretty good soil samples”.

Seven participants described personal connections they had with different CES personnel (UF 4, 6, 8, 12, 13, 14, 15). Four participants had worked in collaboration with agents or faculty to develop workshops or participated in committees with CES (UF 3, 4, 13, 14). UF 8 stated that they were “friends with people that work at the Extension service”, and UF 12 explained that they often reached out to a colleague who worked for CES rather than working with the office (UF 12). One participant was a Master Gardener, certified through CES, and grew up with family who worked for CES in another state (UF 6).

Even the participants that stated they did not have much experience with CES revealed that they had either taken in soil tests, attended workshops, talked with contacts in CES, or even collaborated with CES on projects (UF 2, 7, 8, 12, 13). Other potential points of contact for CES to this population include online resources and information. Aside from attending trainings, several participants indicated the helpful resources available on the CES website (UF 8, 10, 13, 16). UF 8 stated, “the extension website has phenomenal resources”. UF 13 said that they “add UAEX [Arkansas CES’ website] to the end of a Google search just so I can get more localized things”. UF 10 and 16 indicated that they frequented CES’s website for information and publications.

Trainings and workshops

Participants were asked about trainings and workshops they have attended for information related to urban or sustainable farming. Table 13 summarizes this theme.

Table 13

Descriptions and Examples of Trainings and Workshops Theme

Code/Theme	Subtheme	Description	Example
Trainings and Workshops		Includes attended trainings and desired trainings	“Because we were close to [the state office], [we would attend] any time there was a food safety training.” (UF 14)
	Preferred methods of communication	Includes preferred ways of attending trainings and receiving new information	“Most farmers want to see, they want to go to a place where it’s happening and they want to physically see and touch the tools.” (UF 3)

Several participants indicated that they had experience with CES personnel “at trainings and [conferences]” (UF 4, 8, 10, 11, 14, 16). Some had participated in food safety trainings through CES (UF 2, 11, 14), and others had completed pesticide applicator trainings (UF 14). One participant stated, “I think the trainings that they are giving [...] are very important” (UF 11). Several participants stated they had attended workshops at a local farm (UF 2, 5, 6, 9). One participant described one of these recent workshops:

Well, actually, I just last week went to a workshop at [farm]. It was small. “Tools for Small Farmers” or “Small Sustainable Farmers” or something like that. [...] they have a lot of cool workshops available at [farm] now. I don’t know if the [CES] is co-sponsoring those or what, but there’s a lot of cool workshops on pasture culturing and goats and things. (UF 2)

This theme also includes trainings and workshops desired by participants relating to small-scale, organic-type farming. One representative quotation from this theme was made by UF 11—“what we need are just more workshops and resources to figure out how to get off of your product”. UF 6 expressed a desire for permaculture trainings. UF 1 stated that they would like “a workshop just on flower farming [...] or building bouquets for market.” Many participants considered flowers a major product on their operation (1, 2, 3, 6, 8, 9). A concept that emerged when asking about this question was the idea of “targeted workshops”. One participant stated, “I think targeted workshops would be more beneficial for me [...] I appreciate the other workshops [...] because they are great for just beginning” (UF 1).

Preferred methods of communication.

A subtheme from this data comes from questions asked about participants preferred methods of learning new techniques for their operations and ways to receive new information relevant to their farming methods. Most farmers expressed a preference for on-farm or on-site demonstrations with a face-to-face component (Table 14). When online was mentioned, it was usually a secondary preference to the on-site demonstration.

Table 14

Preferred Methods of Communication by Participants

Communication Method	Frequency
On-farm demonstration/ face-to-face	13
Online (Social media, website, videos)	11
Email	7
Workshop	6
Books/ Publications	2

Opportunities

Many participants identified different potential opportunities for CES to interact with, build relationships with, and more appropriately serve this population (UF 1, 3, 4, 8, 9, 10, 11, 13, 14). These opportunities ranged from general to operation-specific. Table 15 provides a description and example of this theme.

Table 15

Descriptions and Examples of Opportunities Theme

Code/Theme	Description	Example
Opportunities	Includes opportunities for increased interaction between CES and urban farmers and more appropriate resources for the population	“I mean I would say if you share this information with folks in the [agriculture] department, the extension department, I’m more than happy to host if folks want to come out, and agents want to come out, or anybody in the department wants to come out and see what we’re doing, I’m more than happy to host groups and to show them what we’re doing and talk to them about ways that we could interact and support each other. So our door is open, we’re welcoming to everyone.” (UF 8)

One example of a way CES could more appropriately serve Arkansas urban farmers was described as:

I think some information that Extension could provide, directed at small vegetable farmers would be nice. One of my complaints is if you look up yield information, they’ll say like, ‘oh, this is how much squash per acre you get,’ or ‘this is how much per hundred feet’ and the problem is that squash produces for like five or six weeks, and it’s like, well I need to know how much I’m going to get each week. Is that going to be 200 pounds per week or 200 pounds for the whole season? It’s just all their education stuff is all very much aimed at people who just plant and harvest one time. (UF 10)

Other suggestions included a comparison to the North Carolina CES, which has “a pretty amazing [agricultural] extension with [...] a full-time person geared toward small-scale [and] sustainable farmers” (UF 9). UF 10 also suggested that another helpful resource, similar to one produced by Oklahoma’s CES, would be “a survey on [farmers’ market] prices. And then they publish it online. They put the low prices and the high prices on end products, something like that would be really useful.” One other example of a suggestion from a participant included:

Maybe something like collaboration between a few state, and it’s probably super hard, but like Southwestern Missouri, Northwest Arkansas, Northeast Oklahoma kind of getting together. Like these people that make up this area that is the Ozarks and putting together kind of information based on that. It’s going to be really tough, and I’m sure it’s not something that’s probably even in the scope of this. But I think that that would be interesting. (UF 13)

One participant expressed a desire for more interaction with CES on their farm, outside of concerns for specific technical assistance (Table 15, UF 8).

Conclusions, Implications, and Recommendations

This study consisted of 16 semi-structured interviews with urban farmers in Northwest and Central Arkansas. Through structural thematic analysis (DeCuir-Gunby et al. 2011) using Microsoft Word® and NVivo 11 themes and subthemes were identified as based on protocol questions or as emergent. Findings were organized by research questions and subsequent protocol questions related to each research question. A summary of findings is presented below.

Summary of key findings and conclusions

Based on interview questions about definitions of urban agriculture and descriptions of the interviewees’ operations, a local definition of urban agriculture, different from the operational definition, was developed for Arkansas as small-scale, fewer than ten acres, diversified, and sustainable farming within city limits that engages with the market, the

community, or both. Questions that helped the researcher arrive at this local definition included:

a) What is your definition of urban agriculture?, b) How would you describe your operation?, c)

What practices do you use to cultivate your crops?, and d) Why did you begin urban farming?

The data derived from this question related to the overall context of urban farming in Arkansas

and provided insight for what it means to be an urban farmer in a rural state. All participants

indicated that they used sustainable methods in various ways on their operation, and all

participants indicated that they engaged with either community or market, or both, to disseminate

their products.

Many of the findings with research questions 2 and 3 were operation-specific and individualized. Several general needs were identified, such as market pricing and strategies, co-

ops, access to appropriate equipment for small-scale farms, and maintenance/retention of an

operational workforce. Overall, participants had positive perceptions of the helpfulness of CES,

even though they thought CES did not have enough resources specific to small-scale, organic-

type farms. Several opportunities for assistance and relationship building were identified, and

Arkansas' Division of Agriculture CES is recommended to evaluate the potential of these

opportunities for programming and technical assistance. Most participants were open to

increased communication and collaboration with CES, so there are opportunities to expand

relationships between CES and urban farmers in Arkansas.

Many of these farmers were unable to articulate beyond their specific needs because they

did not fully understand the scope of CES resources or did not believe CES resources related to

their urban operations; thus, were unable to explain how they could be most appropriately

assisted. This could be attributed to a lack of marketing on part of CES of their participation in

programs and services used by urban farmers. This also provides an opportunity for relationship-

building between CES and Arkansas urban farmers. Additionally, it is important to note a unique quality of the University of Arkansas Division of Agriculture CES—the state office for CES and the main university campus are separated geographically by three hours. This physical separation may contribute to any misunderstandings or missed connections about the direct relationship between CES and the University of Arkansas.

An interesting observation made with the interview data was participants' hesitation to be known primarily as an urban farmer. Several participants indicated that while they would consider themselves urban farmers, primarily they consider themselves market gardeners. This concept, developed through the work of Jean-Martin Fortier (2014) and Eliot Coleman (2018), resonated with the production methods of these participants. Other participants indicated that they did not consider themselves urban farmers; rather, they called themselves urban growers, producers, or local farmers. When asked about their previous agricultural experiences, many stated that while they had gardening experiences, they did not have any agricultural experiences, indicating that they associated the term “farming” with agriculture, but not “gardening”.

An inherent limitation to social science research, most often addressed in quantitative studies, is nonresponse. This group of participants has an “inbuilt and unaccounted for bias” (Small 2009). The researcher only interviewed those who responded to requests for interviews, and those extroverted enough or with the available time to share their thoughts with the researcher for a 30-minute to one-hour interview. Thus, there is no way to adjust the inferences made from the 16 respondents in this study and provides additional limitations to the generalizability of the study, in addition to only having interviewed farmers in the Northwest and Central regions of the state. However, because generalizability is not a goal of qualitative

research, the data presented in this article have a depth and richness that can aid CES personnel in the state.

Relationship to theory

The Community Development Framework for Change (Perez 2016) emphasizes the importance of identifying the activities of and technical assistance deficits for local food system actors. This study provided rich information for CES programming and extended the work of Perez and McCullough (2017) by investigating a specific group of local food system actors. Step four of Perez's (2016) framework requires the assessment, but step five encourages the development of a plan of action for opportunities to develop and implement food system change in these regions. With the findings from this study, CES will have data to develop a plan to support specific programming needs, particularly in relation to market pricing, farming in a public or residential space, and wholesale contracts.

The Agro-Ecological Educator (AEE) theory (Wight 2013) was particularly insightful when used in conjunction with a needs assessment. The three primary components of this theory—*love*, *dialogical communication*, and *praxis*—enhance the concept of a needs assessment and further encompass the community development and relationship-building aspects of the Community Development Framework for Change (Perez 2016). *Love* integrates humanizing dialogue when discussing development and food and enhances productivity and empathy within dialogue. This humanizing dialogue is critical when bridging gaps between CES and populations they have not traditionally served in the past, and the interview process with this needs assessment assisted in this empathetic method, which increased contextual understanding. *Dialogical communication* allows individual actors to understand others' foundational perceptions of nature that are motivating factors for many in urban agriculture. By investigating

the context of urban agriculture within the needs assessment, the researcher expanded the dialogue created through *love* and built foundational understandings to assist not only with program creation, but dissemination, messaging, and relationship-building between CES and Arkansas urban farmers. Finally, *praxis*, the cyclical process of dialogue, planning, action, reflection, and evaluation was initiated by this needs assessment but will continue during program planning, implementation, and evaluation. The researcher encourages CES personnel to familiarize themselves with these theories in order to create space for nuanced understandings of this particular population.

Future research

This study was part of a larger study investigating the relationship between urban farmers and CES. The second part of this study consists of a statewide survey of agricultural extension agents in Arkansas to determine their perceptions, awareness, and experiences with urban farming. Data has also been collected for a social network analysis of these farmers to explore their interpersonal and professional relationships and to identify the modes of information-seeking and sharing among the participants. Future research outside of this population should be conducted with other states that do not have a strong urban aspect of their extension programming to determine potential areas of programming, development, and relationship-building between urban farmers and CES.

As the researcher became immersed in the data, a realization occurred that urban farming is more of a phenomenon that requires exploration outside the scope of a needs assessment. Since most participants expressed operation-specific and individualized needs, it is difficult to make specific recommendations for practice or programming, for all Arkansas urban farmers, with this data. As previously stated, however, the participants in this study expressed general

needs relating to market pricing and strategies, co-ops, access to appropriate equipment for small-scale farms, and maintenance and retention of labor.

Future research should conduct assessments with a more specific approach, such as with urban farmers who grow a certain type of crops, urban farmers who work on non-profit farms, or urban farmers who are just starting out on their operations. This should result in more specific recommendations for programming, resources, and technical assistance to best meet the needs of urban farmers. While the data in this study is valuable, it lends itself to extended investigations with this population—an opportunity for in-depth interaction and relationship building between this population and CES. The researcher recommends conducting future research with a phenomenological approach, to understand the experiences of individual participants more richly. Programs and assistance may also require a one-on-one approach, depending on the specific needs of the farmers. Because participants demonstrated some misunderstandings of the scope of CES resources, CES should focus efforts to market themselves to this population in order for them to understand the services available.

Implications for practice

State CES personnel should conduct needs assessments with urban farmers in their state to determine a local and regional definition of urban farming to guide programming. These needs assessments not only provide valuable information about this population—they also are a mechanism for CES to interact with a potentially underserved community. Based on observations from this study and the researcher's experience, needs assessments can allow trust to be built between CES and these populations, which can increase the visibility and knowledge of CES and could encourage increased participation for CES programs and usage of CES resources.

Most participants indicated their preferred method of communication and learning new techniques for their operation were face-to-face communication or on-site demonstrations. This information should guide program development for urban farming populations in Arkansas. Further research should confirm or compare CES agents preferred methods for programming and communication. If these methods do not align, further research should be conducted to investigate potential programming avenues that are compatible with both populations.

Participants also indicated uncertainty about whether CES had sponsored some programs, trainings, conferences, and workshops they had attended. The researchers recommend that CES in Arkansas market and advertise participation in these events more broadly so that farmers, in this population, could recognize CES involvement in urban farm focused programs. Positive experiences with CES cited by participants included personal interactions with individuals in CES, yet they still regarded the organization as a whole as more connected with traditional, conventional agriculture. While these CES specialists and agents are positive representatives of CES with urban farmers, the CES organization's reputation does not always align with the positive remarks toward these individuals. Thus, utilizing CES specialists and agents who are viewed favorable among urban farmers to host and promote programming is ideal. Additionally, growing the urban farming resources and programming offered by CES should meet the needs of urban farmers while improving the organization's reputation.

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Appendix A

Interview Protocol



Department of
Agricultural Education, Communications
and Technology



Date

Dear Urban Farmer:

My name is Katie Dobbins and I am a Master's student at the University of Arkansas. I am conducting a needs assessment for urban farmers. My goal through this research is to analyze the status and concerns of urban farmers in Northwest and Central Arkansas in order to inform future program development by the University of Arkansas Division of Agriculture's Cooperative Extension Service.

You have been selected to participate in this study because you have a farming operation within city limits under 10 acres and you sell at least a portion of what you produce. There is no risk connected to this project. Participation is voluntary, and you may withdraw at any time. You also may choose to not answer specific questions.

By signing below you consent to participate in the research project and to have data collected about your experience as an urban farmer. If you have any questions, you may contact me through the information below. Thank you for your support and participation.

Signature	Print Name	Date
Katie E. Dobbins, Graduate Student Department of Agricultural and Extension Education University of Arkansas D112 Agriculture, Food and Life Sciences Building Fayetteville, AR 72701 cedobbin@uark.edu		Cassandra K. Cox, Instructor Department of Agricultural and Extension Education University of Arkansas D04 Agriculture, Food and Life Sciences Building Fayetteville, AR 72701 (479)575-2035 ccrumle@uark.edu

This research study has been reviewed by the Institutional Review Board at University of Arkansas. For research-related problems or questions regarding subjects' rights, you can contact Ro Windwalker, the University's Compliance Coordinator, at 479-575-2208 or email irb@uark.edu.

The University of Arkansas is an equal opportunity/affirmative action institution

1. What is your definition of urban agriculture?
 - a. Do you consider yourself an urban farmer?
2. How would you describe your operation?
 - a. What is the size of your operation?
 - b. How many years have you been in operation?
 - c. What crops do you produce?
 - d. Do you sell any other products?
 - i. Do you process them on-site?
 - e. Do you have any certifications?
 - i. Organic
 - ii. Certified Naturally Grown
 - iii. Fair Trade Sustainability Alliance
3. Why did you begin urban farming?
4. What are your major concerns and problems as an urban farmer?
 - a. What specific research would assist you with addressing these concerns?
 - b. What specific resources would assist you with addressing these concerns?
5. What trainings and workshops have you attended for information and resources relating to your operation?
 - a. Did the University of Arkansas Cooperative Extension Service sponsor any of these trainings or workshops?
 - i. If no, who sponsored the trainings or workshops?
6. What sources do you use for information regarding urban agricultural practices and techniques?
 - a. Print
 - i. Newspaper
 - ii. Magazines
 - iii. Newsletter
 - iv. Trade publication
 - b. Radio
 - c. Television
 - d. Social Media
 - i. Facebook
 - ii. Twitter
 - iii. Instagram
 - iv. Pinterest
 - v. Other: _____
 - e. Internet
 - i. Which websites?
 - f. Other producers
 - i. Who? _____
 - g. Other: _____
 - h. How often do you use each source?
 - i. Source #1:
 - ii. Source #2:

- iii. Source #3:
 - iv. Source #4:
 - v. Source #5:
 - vi. Source #6:
 - vii. Source #7:
 - viii. Source #8:
 - ix. Source #9:
 - x. Source #10:
- i. Of the information sources you listed, were any sponsored or produced by the Cooperative Extension Service?
7. Have you ever utilized the Cooperative Extension Service outside of the previously mentioned areas?
- a. Please describe your experience(s) with Cooperative Extension.
8. Have you ever had access to information resources from the Cooperative Extension Service?
9. How would you most likely hear about a new training opportunity (Medium, source, peer)?
10. On a scale of 1 to 5, with 1 being not at all helpful, and 5 being extremely helpful, how would you rate the Cooperative Extension Service's resources and information relating to urban agricultural needs?
- | | | | | | |
|--|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
11. What are your preferred methods of learning new techniques and practices for operating your farm?
- a. Online learning modules
 - b. On-site farm demonstrations
 - c. Off-site farm demonstrations
 - d. Face-to-face communication
 - e. Online communication
 - f. Other: _____
12. To whom do you currently sell your products?
- a. Local Restaurants
 - b. Farmer's Market
 - c. CSA
 - d. Other: _____
13. Would you be interested in information and research about potential new markets for your products?
- a. What specific information and research would be most beneficial for you?
 - b. How would you like to receive this information (Electronic or print media, email, radio, newspaper, social media)?
 - i. Follow-up for specific source
14. General Demographic Questions:
- a. Prior to being an urban farmer, did you have any other agricultural experiences?
 - i. Grew up on a farm
 - ii. Worked on a farm
 - 1. How long?

- iii. FFA
- iv. 4-H
- v. Other: _____
- b. What is your gender?
 - i. Female
 - ii. Male
 - iii. Prefer not to respond
- c. How old are you?
- d. What is the highest level of education that you completed?
 - i. Some high school
 - ii. High school
 - iii. Technical certification
 - iv. Some college
 - v. Associate's degree
 - vi. Bachelor's degree
 - vii. Master's degree
 - viii. Doctorate of Philosophy
 - ix. Other: _____

Appendix B

IRB Approval Notice



To: Catherine Elizabeth Dobbins
From: Douglas James Adams, Chair
IRB Committee
Date: 07/10/2018
Action: Exemption Granted
Action Date: 07/10/2018
Protocol #: 1804115868
Study Title: Urban Agriculture in Arkansas: A Needs Assessment of Producers and County Extension Agents

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu.

cc: Casandra Kay Cox, Investigator

Chapter III: A Survey to Describe the Perceptions of Arkansas Agriculture County Extension Agents toward Urban Agriculture

Keywords: Cooperative Extension Service, Urban Agriculture, County Extension Agents, Sustainability

Introduction

Urban agriculture is complex and nuanced. Jac Smit pioneered the emergence of urban agriculture in the 1960s as a mechanism for contributing to the sustainable development of cities in the Global South (Bellows & Nasr, 2010). It has since blossomed into a domestic solution for health problems in both inner cities and rural areas, community food security, and green urban infrastructure. People often perceive the needs of rural and urban populations to be separate and distinct, even competing in some cases, but the same forces driving rural people from their land also contribute to rising food insecurity and diet-related illness around the world. A large proportion of the urban poor once worked off the land in rural areas, so the crises are inextricably linked. One approach to combating urban food insecurity and rural health crises is creating urban-rural linkages where local urban farms feed cities and surrounding areas, and this purchasing power within the cities stimulates investment in the rural sector (Bellows & Nasr, 2010). While the primary motivation for urban agriculture in low-income countries in the Global South is food security, for many cities in the U.S., the motivations range from food security, local food system development, food waste reduction, community development, and green infrastructure (Rogus & Dimitri, 2014).

Many modes of urban agriculture exist, which make it difficult to determine a comprehensive definition (Rogus & Dimitri, 2014). One of the most familiar and common forms is community gardening, which often provides garden space to members of the surrounding

community to grow produce, herbs, and flowers, as well as native plants, for personal use rather than for sale (Reynolds, 2011). Other forms include institutional gardens, for example at schools, hospitals, or prisons, non-profit gardens and farms, and commercial/for-profit farms (McClintock, 2012). The researcher determined the definition of urban agriculture in Arkansas through a previous study—small-farms, fewer than 10 acres, located within city limits that actively engage with the market either through direct-to-consumer sales; coordinators, or institutional or retail buyers (Dobbins et al., 2018; NASS, 2014; Opitz et al., 2016; Perez & McCullough, 2017; Rogus & Dimitri, 2014).

Urban agriculture and alternative food networks often relate to issues of environmental sustainability, economic justice, and food security (Stevenson, Ruhf, Lesberg, & Clancy, 2007). Other connected issues include social justice and community empowerment (Reynolds, 2011). Urban farmers have differing motivations for operation. Some practice urban farming as an effort to live sustainably or to provide food for themselves outside of the dominant agrifood system. Ecological sustainability or social equity issues pertaining to food systems generally motivate these growers. Commercial urban farmers usually operate privately-owned, small-scale farms, and operational activities include production, harvest, and sales. Community-based urban farms often differ from community gardens because farming activities reflect discontent with and critiques of the social and dominant food systems (Reynolds, 2011).

The Cooperative Extension Service (CES) has several potential access points to alternative food networks (Clark, Loveridge, Freedgood, & Hodgson, 2017; Dunning, Creamer, Lelekacs, O'Sullivan, Thraves, & Wymore, 2012; Reynolds, 2011). These include providing technical assistance through increased horticultural knowledge among practitioners, creation of new types of community markets, management of organizational activities, information on

securing land access, and mechanisms for profitability and business activities (Reynolds, 2011). Many of these concepts derive from issues faced by small-scale farmers in general, but may be intensified when operations are located in city centers. These issues can serve as potential areas for program development relating to urban agriculture. Reynolds (2011) emphasizes that future relationships between CES and alternative food systems, specifically urban farmers, should be categorized by cooperation, dialogue, and co-learning. Some of these relationships have begun through the work of Perez and McCullough (2017), who organized local food meetups to determine the needs of local food system stakeholders in Arkansas, but limited social science research focused specifically on Arkansas urban farmers is available.

It is important to explore CES staff's interest in developing and expanding programming in urban agriculture (Reynolds, 2011). Integrating urban food-system concepts into research and extension programs, building CES' relationships with urban communities, researching ecology and agronomics for urban areas, programming for community leadership development, renewing focus on community food security, and facilitating communication and information exchange between food system actors are recommended activities for CES to expand into urban agriculture (Reynolds, 2011). Because of the variety of access points for CES within urban agriculture, the next step to achieve successful programming is to assess the perceptions of CEAs towards urban agriculture.

Literature Review

The Cooperative Extension Service.

The Cooperative Extension Service (CES) is a national system that provides research-based information to the public through the partnerships between the U.S. Department of Agriculture (USDA)'s National Institute of Food and Agriculture (NIFA) and the land-grant universities in each state (NIFA, n.d.). The founders of CES aimed to deliver programs to rural

communities, but this traditional focus on rural communities poses a challenge for CES due to rapid urbanization and migration to urban centers (Webster & Ingram, 2007). The effectiveness of CES traditionally occurred because Extension faculty derived programming directions directly from the informational needs of the public (Schaefer, Huegel, & Mazzotti, 1992). These population shifts challenge CES to redefine its programming to reach the urban public and to build relationships with the members of these communities. CES has traditionally focused less on urban food production, even though urban agriculture has the potential to encompass the six major areas of the Extension system: youth development, agriculture, leadership development, natural resources, family and consumer sciences, and community and economic development (NIFA, n.d.; Reynolds, 2011).

Urban agriculture is of particular significance in this redefinition process, due to CES' history of assisting with rural and conventional agricultural communities. Reynolds (2011) defined urban agriculture as "agricultural production located in and near urban centers, and that which integrates in the urban economic, social, and ecological system" (p. 198). CES can incorporate its foundational knowledge of rural agricultural production systems into new programming designed to address areas where urban farmers struggle and provide them with resources to successfully start and operate in the urban agriculture sector. CES can assist urban areas through its distance education framework and it can adapt its rural community development models and programs to the urban setting (Borich, 2001). The six focus areas of CES described above (NFA, n.d.; Reynolds, 2011) suggest that it can assist urban farmers in the areas of urban husbandry, soil testing, marketing, business management, community development, and education of nonfarmers/potential consumers about the importance of urban agriculture and related infrastructure (Reynolds, 2011). CES has a history of involvement with

community change, as they work with many locally elected officials and are familiar with community political networks (Clark et al., 2017). Thus, CES has a potentially multi-faceted role in alternative food systems.

CES personnel play an important role in community and food system development and by providing local resources; thus, it is necessary to understand the various perspectives of CES personnel, as well as their goals for food system change (Clark et al., 2017). They are key community stakeholders due to their relationships with local decision-makers, producers, and consumers, and they historically have connected actors within the food system. However, studies have demonstrated that CES personnel do not have a clear understanding or definition of what constitutes urban agriculture, which can limit their effectiveness with this population (Reynolds, 2011). This lack of clarity has potential effects on creating and expanding urban agriculture programming. This can limit the results of a study because confusion and discussion over the operational definition can dominate the dialogue rather than focusing on actual future program development. The importance of developing a consensus-based contextual definition of urban agriculture cannot be understated. This will allow for the expansion of technical support and educational programming to this sector. Nationally, CES faces a budget crisis that has ended previous CES-funded urban agricultural programs, such as the USDA Urban Garden Program. This may limit the development of new programs as competition for program funding has increased. However, by analyzing the baseline need for urban agriculture programming from CES's perspective, CES policymakers can understand the needed direction for future programming to reach the desired audience. It also presents an opportunity for CES to engage with urban communities through urban agriculture (Reynolds, 2011). Conducting needs assessments also provides data that can support programmatic funding requests.

Relevant to this study is the National Research Priority 6: Vibrant, Resilient Communities, which included the research priority question, “How do agricultural leadership, education, and communication teaching, research, and extension programs impact local communities?” (Roberts et al., 2016, p. 51). With migration from rural to urban areas due to rapid urbanization, a reduction in agricultural labor has occurred, but the last decade has seen an increase in urban agriculture (Roberts et al., 2016; Rogus & Dimitri, 2014). Urban farms are generally involved in the local community, which can potentially help a community become more resilient, especially in regard to food security

Theoretical framework: Builder, Weaver, and Warrior Work.

It is important to identify the role of CES within alternative food systems. Traditionally, alternative food system movements are associated with opposition to the dominant food system rather than actual change development strategies, which has made CES cautious of associations with certain change actors (Allen, 1999; Clark et al., 2017). However, many of these food systems are constructed as viable alternatives to the corporate industrial food system, rather than as entities directly undermining the foundation of the industrial food complex (Gliessman, 2015). This orientation is conducive to the function and operation of CES, because it allows CES faculty to work within these alternative food systems by helping construct market-centric alternatives that do not threaten CES’s traditional relationships with conventional agriculture (Clark et al., 2017).

Understanding change-oriented activities through social movement literature helps contextualize the nature and limitations of alternative food and agricultural networks (Stevenson et al., 2007). Social movements create informal networks consisting of individuals, groups, communities, and organizations that share beliefs about a specific problem or set of related

problems and work to create solutions for them. These social movement and change-oriented activities are analyzed using two frameworks within the Builder, Weaver, Warrior Work theory (Stevenson et al., 2007). The first framework relates to the goals of change activities, and includes three orientations: inclusion, reformation, and transformation. Inclusion focuses on increasing the participation of marginalized actors in the dominant food system. Reformation relates to changing the operating guidelines of the conventional agricultural food system. Transformation aims to create alternative paradigms to guide the future of the dominant food system (Stevenson et al., 2007). The second analytical framework focuses on the orientation of change activities within the modern, dominant food system, and it consists of warrior work, builder work, and weaver work (Stevenson et al., 2007). Warrior work is the political arm of the social change framework, acting as resistance to the dominant system. Builder work is defined as reconstruction, and operates to create alternative food systems and models within the economic sector. Finally, weaver work develops strategic, conceptual linkages between warrior and builder work. It works to connect these two divergent actors, operating both in the political and economic sectors to mobilize civilians within society (Stevenson et al., 2007).

CES faculty self-identify as builders, working within alternative spaces through economic practices, rather than oppositional spaces through political practices (Clark et al., 2017). CES respondents in Clark's study viewed the marketplace as a mechanism for change (2017). Extension educators also identify as weavers, creating the connections as educators and facilitators, even though their change strategies more closely aligned with builder work. Much of their weaving work would yield future building work. Weaver work is necessary for long-term change strategies, and could help develop a master framework for change mobilization, but generally, CES educators focus on non-transformative change (Clark et al., 2017). However,

food system transformation depends on creating collaborative initiatives between individuals and organizations. CES can potentially play a critical role in cultivating these relationships (Dunning et al., 2012).

The self-identified political neutrality of CES inhibits some CEAs and other educators from participating in transforming the food system. CES personnel maintain relationships with local decision-makers, which is both beneficial and not (Clark et al., 2017). By maintaining these relationships, they can have access to resources and decision-making processes that would help alternative food systems, including urban farmers. Conversely, local governments often provide monetary resources, which can limit the agency of a CEA and CES as a whole to enact change if local officials perceive it to be outside of the norm for CES. This can lead to a political neutrality for CES, which it self-identifies, that frames CES' role strictly as a unidirectional channel of conveying research-based information (Clark et al., 2017; Peters, 2006). It also limits the ability of CES to work within a social change movement because its practices under the same rules used to create the system (Clark et al., 2017; Hassanein, 2003). With all of this in mind, it is important to note that CES can play a role in these alternative food systems. Clark (2017) determined that Extension educators' primary goal within food system change is to include marginalized actors into the system by building, or bringing resources to projects directed toward marginalized producers and consumers. Based on Stevenson's theory (2007), CES employees can act as builders working to increase inclusion of these marginalized actors.

In order for CES to build successful collaborative relationships through its unique set of resources, local food systems should be continually legitimized as an important issue (Dunning et al., 2012). One strategy for this is to strengthen communications between potential collaborators. Arkansas' CES has already made steps toward this through the work of Perez and

McCullough, who hosted five regional local-foods meetups in the state, bringing together institutional buyers, producers, direct marketers, and other key stakeholders of Arkansas' local food system (2017). A second strategy would be to incorporate local food ideas and initiatives into the frameworks and routines already established by and familiar to CES and their advisory boards (Dunning et al., 2012). These advisory boards inform CES staff of community needs. A third strategy is to integrate programming across all extension program areas and create collaborative cross-program relationships. The fourth strategy designs new evaluation measures to quantify and qualify food systems work of CES staff. Current programming focuses on short-term projects that are not conducive to systemic change. These new evaluation measurements would allow evaluators to track food system change long-term (Dunning et al., 2012).

These recommendations are included to frame survey constructs as well as contextualize the space for CES within alternative food networks.

Methods

The purpose of this survey was to describe the perceptions, awareness, and abilities of Arkansas agricultural CEAs in relation to urban agriculture. The following objectives guided this study:

- 1) Describe CEAs' perceptions of urban agriculture.
- 2) Determine CEAs' awareness of urban agriculture.
- 3) Describe CEAs' self-reported ability to advise and assist urban farmers.
- 4) Determine CEAs' identified barriers and benefits to participating in urban agricultural programs.
- 5) Determine if responses of CEAs in counties serving predominately-metropolitan areas differ significantly from the responses of CEAs in counties serving non-metropolitan areas.

Instrument development.

This study implemented a researcher-designed, quantitative, web-based survey instrument containing questions on a Likert-type scale related to CEAs' activities, opinions, knowledge, and attitudes of urban agriculture (Moser & Kalton, 2016). Data collected from face-to-face interviews with urban farmers in a previous study informed several survey questions in this instrument (Dobbins et al., 2019). These survey constructs addressed the needs of urban farmers, including research, information, training, and programming needs. Other constructs addressed objectives 1-4 in the preceding paragraph.

The researcher pre-tested the questionnaire through think-aloud questioning, also known as a cognitive interview, with a primary respondent about how he or she responded to the survey questions (Collins, 2003). This complemented the pilot test of the survey by checking for potential misunderstandings and misinterpretations in the survey instrument. It also allowed the researcher to assess the validity of the instrument. The pilot test was conducted with a small number of non-agriculture CEAs and CES county staff chairs who had similar characteristics and projects to agricultural CEAs. These participants included Family and Consumer Science (FCS) agents and agents with 4-H assignments. These participants did not participate in the final survey data collection. The researcher used split-half correlation to assess internal consistency of the survey through Cronbach's α , which is the mean of all possible split-half correlations for a set of items or constructs (Jhangiani & Chiang, 2015). These measurements contributed to the reliability of the instrument. Reliability, as measured by Cronbach's alpha, was reported at .97. Face and content validity was determined by a panel of experts at the University of Arkansas, the University of Arkansas Division of Agriculture Cooperative Extension Service, and the University of Georgia. Two experts had a background working with CES, one of whom was the

leading local food expert in the state. Three were experts in survey development who ensured that constructs measured what was intended.

Data collection and analysis.

The target population for the survey was the agricultural CEAs in Arkansas. This study implemented census sampling for the 100 agricultural CEAs and county staff chairs, acquired through permission from district directors and the CES personnel directory. Because extension professionals use email as a communication tool, it was determined that this would be an effective mechanism for survey dissemination (Dillman, Smyth, & Christian, 2014). The researcher sent email invitations to the CEAs and staff chairs to participate in the online survey through the CES email system, which contained a description of informed consent and scope of the study (Appendix C). The researcher emailed the survey to the CEAs on February 1, 2019, with follow-up reminders on February 7, February 19, and February 27 based on recommendations to improve survey response rate by Dillman (2014). Survey attempts were limited to one per Internet Protocol (IP) address to prevent participants from taking the survey more than once. The total number of responses received was 57, yielding a 57% response rate. Data collection concluded on February 28, 2019.

Data collected from participants was stored in a password-protected database and converted into a Microsoft Excel spreadsheet. Using SAS and SPSS for data analysis, the researcher used descriptive statistics to establish frequencies, means, and percentages for each construct and objective. Comparative statistics allowed the researcher to establish frequencies, means, and percentages to achieve objective 5.

This study was submitted for approval by the University of Arkansas Institutional Review Board (IRB). IRB determined that the study would not expose participants to more than minimal

risk, and confidentiality would be maintained to the extent allowed by the law. IRB approval (#1809143362) can be viewed in Appendix D.

Results

Sections of the questionnaire related to four major constructs: agent perceptions of urban agriculture, potential barriers to assisting urban farmers, agent awareness of and self-reported ability to advise and assist with urban agriculture, and differences between agent perceptions in metropolitan and non-metropolitan areas. Findings in this section are segmented by construct, with each construct relating to a research objective. All statements were analyzed to determine potential significant differences between regions in the population, and while discussed within each section briefly, this data is presented in the final section in Table 8.

Agent perceptions of urban agriculture.

This section covers findings that contribute to addressing the first research objective: to describe CEAs' perceptions of urban agriculture. Sections of the questionnaire pertaining to this objective included Likert-type questions regarding definitions of urban agriculture, county concentrations of urban agriculture, practices used in urban agriculture, and CES resources and urban agriculture. Participants were asked to identify their level of agreement with various definitions of urban agriculture. Table 1 displays the number of agents who agreed with various definitions of urban agriculture. Analysis of the results showed that most participants "agreed" or "slightly agreed" with the definition "farming in and around urban areas" (90%), followed by "small farms (fewer than 10 acres) located within city limits that actively engage with the market either through direct-to-consumer sales, coordinator, or institutional/retail buyers" (88%), and "farming within city limits" (84%). The definition that participants "agreed" or "slightly agreed"

with the least was “farming that involves education” (57%). All definitions demonstrated at least a majority agreement or slight agreement amongst participants.

Table 1

Level of Agreement with Various Definitions of Urban Agriculture (n = 57)

Question	Frequency and Percentage of Likert-Type Responses											
	No Response		Disagree		Slightly Disagree		Neither Agree nor Disagree		Slightly Agree		Agree	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Farming in and around urban areas	0	0.0	1	1.8	2	3.5	3	5.3	14	24.5	37	64.9
Farming within city limits	0	0.0	1	1.8	1	1.8	6	10.5	15	26.3	34	59.6
Farming that involves the community	0	0.0	1	1.8	3	5.3	12	21.0	19	33.3	22	38.6
Farming that involves education	0	0.0	4	7.0	5	8.8	16	28.1	10	17.5	22	38.6
Production, distribution, and marketing of food and products in the metropolitan core and the surrounding edges	2	3.5	3	5.2	2	3.5	5	8.8	16	28.1	29	50.9
Small farms (fewer than 10 acres) located within city limits that actively engage with the market either through direct-to-consumer sales, coordinator, or institutional/retail buyers	1	1.8	2	3.5	1	1.8	3	5.2	18	31.6	32	56.1

Participants were asked to identify if there were small-scale, diversified farms in their counties. Of the 57 responses, 61.4% ($n = 35$) said yes, 29.8% ($n = 17$) said no, 7.0% ($n = 4$) said they were unsure, and 1.8% ($n = 1$) provided no response. After responding to this question,

participants were informed that urban agriculture, as it was used in the rest of the survey, pertained to “small-scale, diversified farms less than 10 acres inside the city limits selling and producing for markets”. Participants were then asked to identify the concentration of urban agriculture in their counties (Table 2). The most frequent response to this question was “low” (43.9%), followed by “nonexistent” (26.3%).

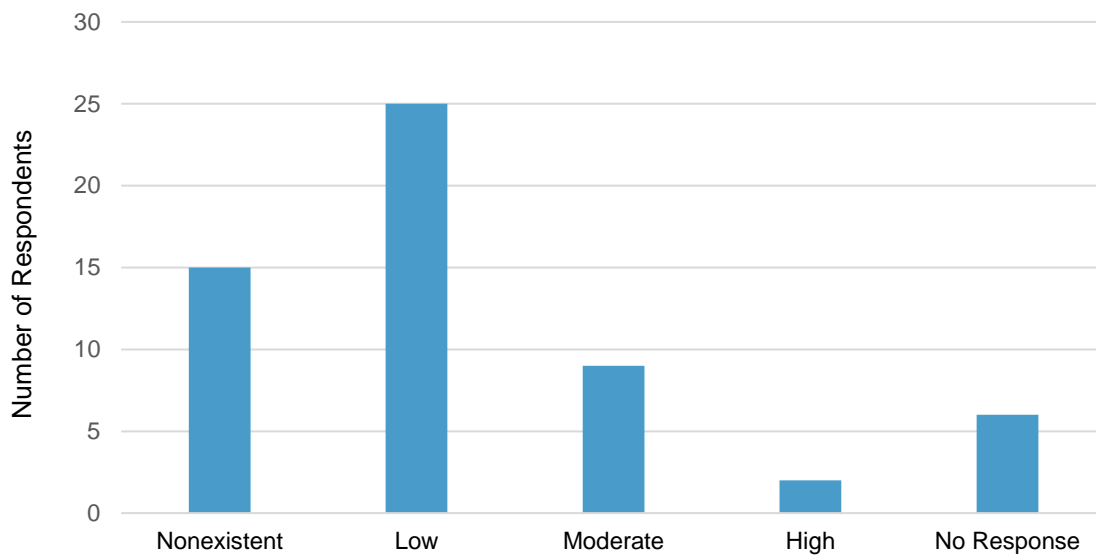


Figure 1. Perceived concentration of urban agriculture in participants’ counties ($n = 57$).

In addition to identifying the perceived concentration of urban agriculture in their counties, participants were asked to identify the frequency with which urban farmers in their county engaged with various practices. Table 2 displays the number and percentage of perceived level of usage for various practices attributed to urban farmers. Few practices were determined as highly practiced, such as crop rotation at 22.8% ($n = 13$) and sustainable farming practices at 14.0% ($n = 8$). The highest response rates included 56% ($n = 32$) of participants reporting a medium-level usage of sustainable practices, and 56% ($n = 32$) reporting a low-level usage of certified organic practices (Table 2). As demonstrated in Table 3, between 5.3% ($n = 3$) and 42.1% ($n = 24$) were unsure of the levels to which these practices were used in their counties by urban farmers.

Table 2

Level to Which Small-Scale Diversified Farms in Participants' Counties Use Certain Practices (n = 57)

Question	Frequency and Percentage of Responses									
	No Response		Unsure		Low		Medium		High	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Sustainable Farming Practices	5	8.8	3	5.3	9	15.8	32	56.1	8	14.0
Certified Naturally Grown (CNG)	5	8.8	12	21.0	25	43.9	15	26.3	0	0.0
Organic (Certified)	5	8.8	12	21.0	32	56.1	7	12.3	1	1.8
Organic (Non-Certified)	5	8.8	10	17.5	24	42.1	15	26.3	3	5.3
Permaculture	5	8.8	24	42.1	23	40.3	5	8.8	0	0.0
Chemical-Free	5	8.8	9	15.8	30	52.6	13	22.8	0	0.0
No-till	5	8.8	10	17.5	27	47.4	11	19.3	4	7.0
Cover Cropping	5	8.8	8	14.0	20	35.1	22	38.6	2	3.5
Crop Rotation*	5	8.8	7	12.3	6	10.5	26	45.6	13	22.8

Note. Statements marked with an asterisk (*) were found to have significantly different responses between two or more regions within the sample.

Figure 2 displays the frequencies with which participants deal with clients who require urban agricultural assistance. The majority of participants interacted with these clients “never” (35.1%), “yearly” (22.8%), “monthly” (22.8%), or “weekly” (10.5%). Five respondents provided

no response (8.8%). No participants indicated that they dealt with these type of clients daily (Figure 2).

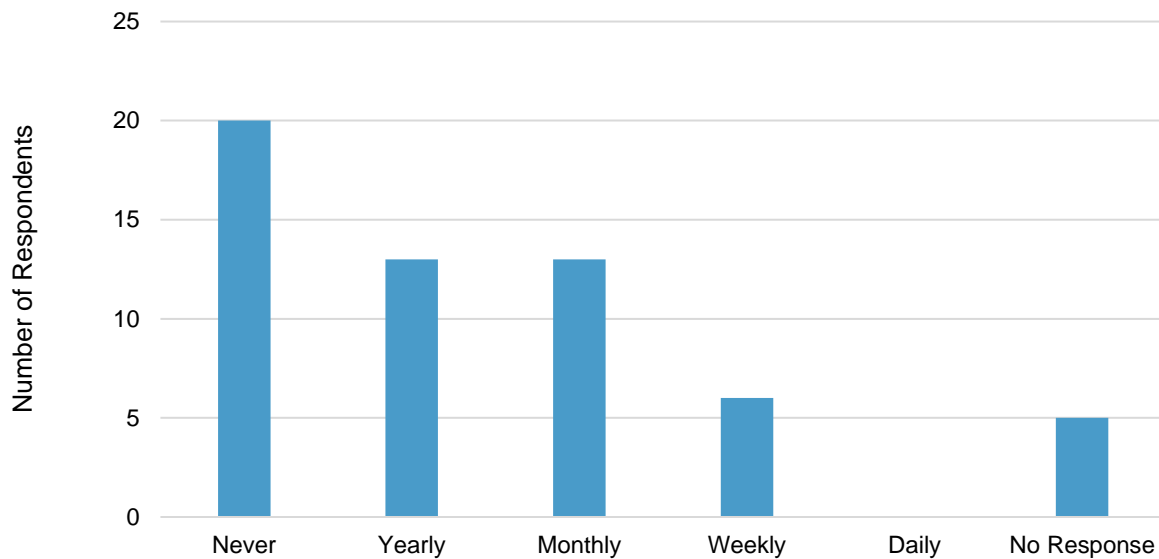


Figure 2. Frequency of working with clients requiring assistance with urban agriculture ($n = 57$).

Participants were asked to determine and identify their level of agreement with statements relating CES and its urban agriculture resources, as well as CES’s potential value as a resource for urban farmers (Table 3). The highest percentage of agreement (73.6%) was reported for the statement “CES is a valuable resource for urban farmers” ($n = 42$), while the highest percentage of disagreement (38.6%) was reported for the statement “CES should not focus on developing programs related to urban agriculture” ($n = 22$). Out of the 57 participants, 61.4% ($n = 35$) “agreed” or “slightly agreed” with the statement “CES should provide more urban agriculture resources”, 42.1% ($n = 24$) with “more time should be set aside for CES agent training for urban agriculture”, and 42.1% ($n = 24$) with “more funding should be set aside for CES agent training in the area of urban agriculture”. The statement “more time should be set aside for CES agent training” had a relatively high percentage (35.1%) of “neither agree nor disagree”, and this statement demonstrated significant differences between responses from different regions within the population (Table 8).

Table 3

Level of Agreement with Statements Regarding CES and Urban Agriculture (n = 57)

Question	Frequency and Percentage of Likert-Type Responses											
	No Response		Disagree		Slightly Disagree		Neither Agree nor Disagree		Slightly Agree		Agree	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
CES is a valuable resource for urban agriculture farmers.	5	8.8	0	0.0	1	1.8	0	0.0	9	15.8	42	73.6
CES should provide more urban agriculture resources.	5	8.8	0	0.0	2	3.5	15	26.3	14	24.6	21	36.8
More time should be set aside for CES agent training in the area of urban agriculture.*	5	8.8	4	7.0	4	7.0	20	35.1	8	14.0	16	28.1
More funding should be set aside for CES agent training in the area of urban agriculture.	5	8.8	4	7.0	4	7.0	20	35.1	10	17.5	14	24.6
CES should not focus on developing programs related to urban agriculture.	5	8.8	22	38.6	10	17.5	13	22.8	4	7.0	3	5.3

Note. Statements marked with an asterisk (*) were found to have significantly different responses between two or more regions within the sample.

One question required participants to check all that applied to the question “have you observed any of the following benefits as a result of urban agriculture in your county?”.

Responses are provided in Figure 3. Many participants (63.2%) indicated that they had not observed any benefits in their county (analyzed through non-response to question). Of the

provided responses, 28.1% of participants identified increased access to healthy food, 24.6% identified improved local economy, and 15.8% identified increased food security as observed benefits (Figure 3). Participants were provided an open-response option to this question as well, and of those who responded ($n = 5$), benefits included “it brings farmers together to share ideas”, “local farmers marketing”, “increased agricultural understanding/appreciation”, and “more producers selling at farmers markets”.

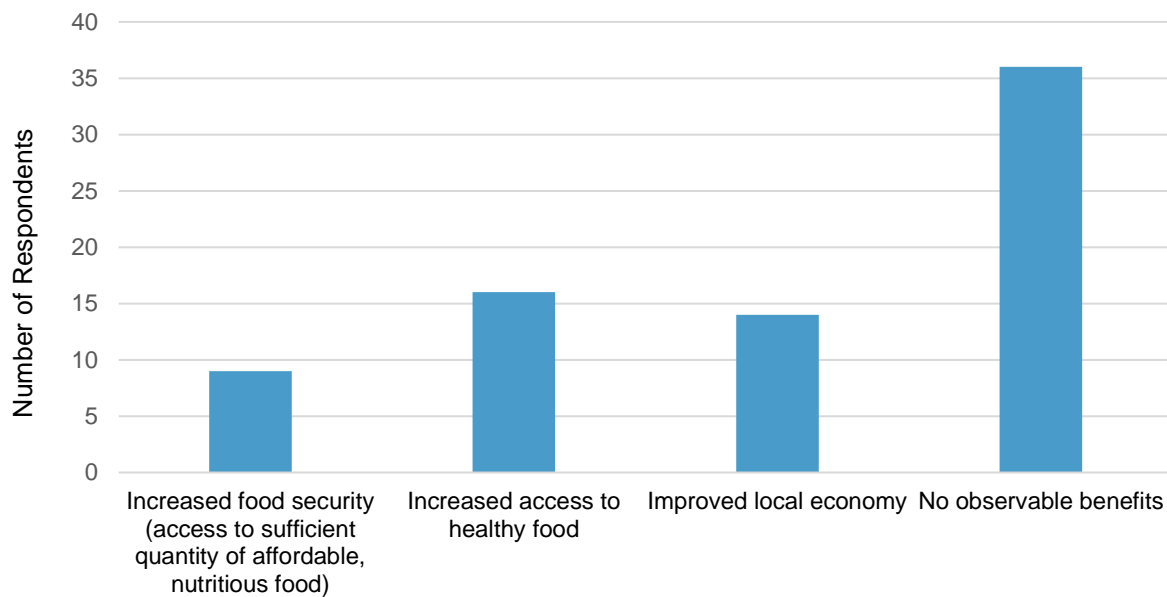


Figure 3. Participant responses about observable benefits from urban agriculture in their counties ($n = 57$).

Agent awareness of and self-reported ability to advise and assist with urban agriculture.

Participants were asked to identify their perceived level of awareness relating to urban agriculture. Questions in this section related to research objective 2, to determine CEAs’ awareness of urban agriculture, and research objective 3, to describe CEAs’ self-reported ability to advise and assist urban farmers. Frequencies and percentages for perceived level of knowledge about urban agricultural clients’ needs are presented in Figure 4. The most frequent response

about perceived level of knowledge was “not knowledgeable at all” (36.8%) closely followed by “slightly knowledgeable” (35.1%). Ten participants did not respond to this question.

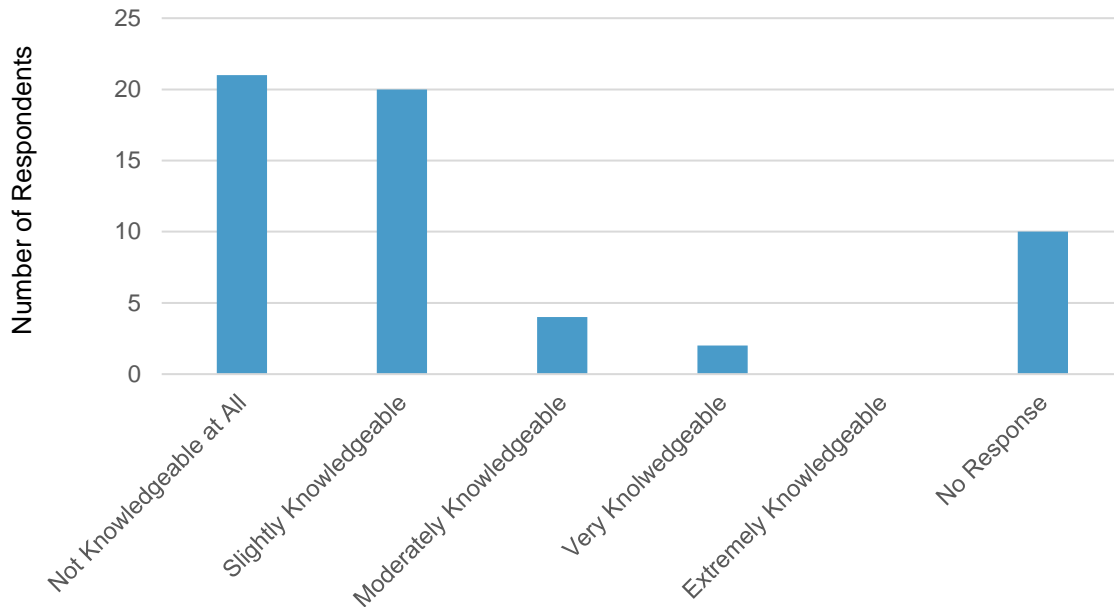


Figure 4. Frequency of reported (perceived) level of knowledge regarding urban farmer needs ($n = 57$).

One section of the questionnaire attempted to identify participants’ awareness of where urban farmers in their county sell their products. The highest reported location for this section was farmers’ markets, where 35 participants (61.3%) indicated urban farmers “often” or “always” sold there, followed by on-farm or direct-to-consumer sales, reported “often” or “always” by 24 participants (42.1%) (Table 4). Participants ($n = 35$) reported community-supported agriculture and schools most frequently as “never” or “not often” (61.4%).

Table 4

Participant Identification of Where Urban Farmers in their Counties Sell Their Products (n = 57)

Question	Frequency and Percentage of Likert-Type Responses											
	No Response		Never		Not Often		About Half of the Time		Often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Local Restaurants*	10	17.5	10	17.5	26	45.6	4	7.0	6	10.5	1	1.7
Farmers' Markets	9	15.8	5	8.8	3	5.3	5	8.8	32	56.1	3	5.2
Community Supported Agriculture (CSA)*	11	19.3	26	45.6	9	15.8	4	7.0	7	12.3	0	0.0
Grocery Stores*	10	17.5	18	31.6	19	33.3	7	12.3	2	3.5	1	1.8
On-farm/ Direct-to-consumer Sales	10	17.5	5	8.8	3	5.3	15	26.3	20	35.1	4	7.0
Schools*	10	17.5	21	36.8	20	35.1	4	7.0	2	3.5	0	0.0

Note. Statements marked with an asterisk (*) were found to have significantly different responses between two or more regions within the sample.

Participants were asked to “check all of the following that relate to the needs of urban farmers”. Provided response options and frequency of identified answers are provided in Figure 5. These options were informed by literature and previous studies (Dobbins et al., 2019). Not all provided response options were from the literature, but rather responses more similar to issues of conventional farming to gauge participants’ awareness of the issues and needs of Arkansas urban

farmers. Responses not from the literature are marked with an asterisk (*) in Figure 5. The two most frequent responses were “pest management” (71.9%) and “soil quality” (70.2%), followed by “pricing of products” (59.6%), and “commercial-use pesticides” (57.9%). The least frequent response was “non-profit management” (26.3%). Nine participants provided no response.

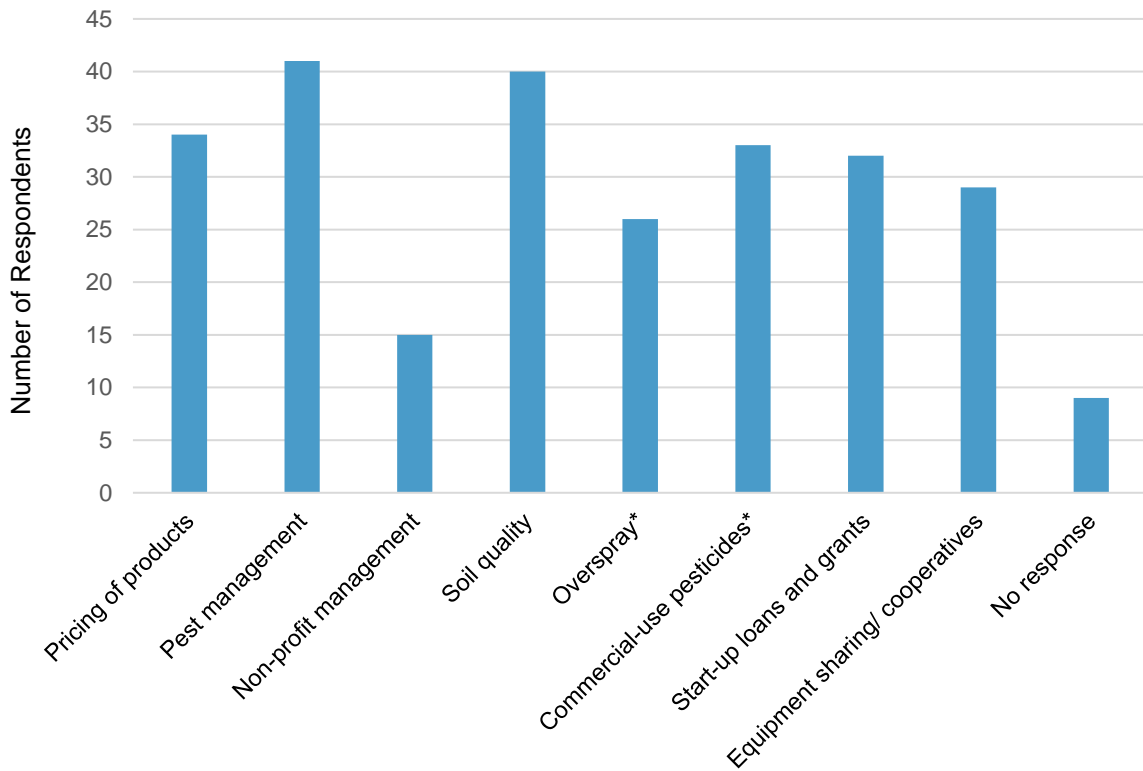


Figure 5. Frequency of responses to items related (or unrelated) to urban farmer needs ($n = 57$). Unrelated responses are indicated with an asterisk (*) and were included for comparison with related (literature-supported) needs.

Another aspect of this research objective was addressed with responses to the question “how confident are you in your ability to advise and assist urban agricultural clients?”.

Responses presented in Figure 6 show the highest reported response was “confident” (29.8%), followed by “neither confident or not confident” (19.3%) and “somewhat confident” (19.3%). The lowest response was “not confident” (7.0%).

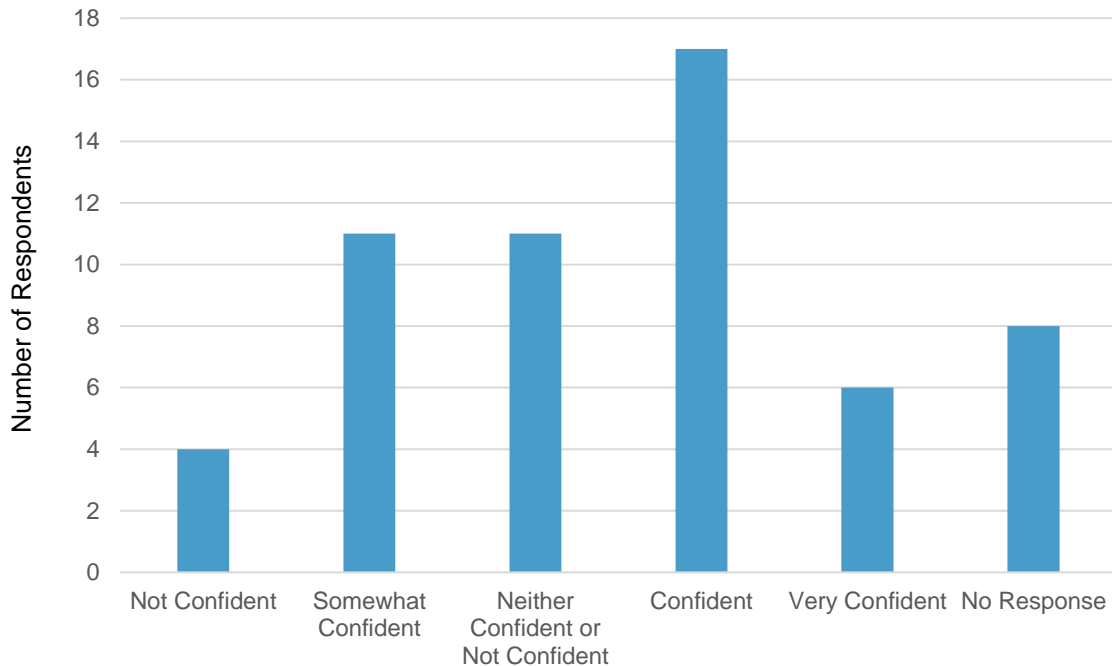


Figure 6. Frequency of reported level of confidence in ability to assist urban agricultural clients ($n = 57$).

Potential barriers to assisting urban farmers.

Participants were asked to respond to several statements or questions relating to potential barriers to serving or assisting with urban farmers and related programming. These questions related to research objective 3, to determine CEAs’ identified barriers and benefits to participating in urban agricultural programs. Constructs included difficulty assisting with clients, resource availability, current programming, and potential programming. Figure 7 demonstrates the frequency of responses to the statement “It is difficult to assist with urban agricultural clients’ needs”. Of the 57 participants, 24.6% “agreed” or “slightly agreed” with this statement, while 42.1% “disagreed” or “slightly disagreed” with this statement. Equal numbers of participants ($n = 14$) responded “disagree” and “neither agree nor disagree”, or 24.6% each. Five participants (8.8%) provided no response.

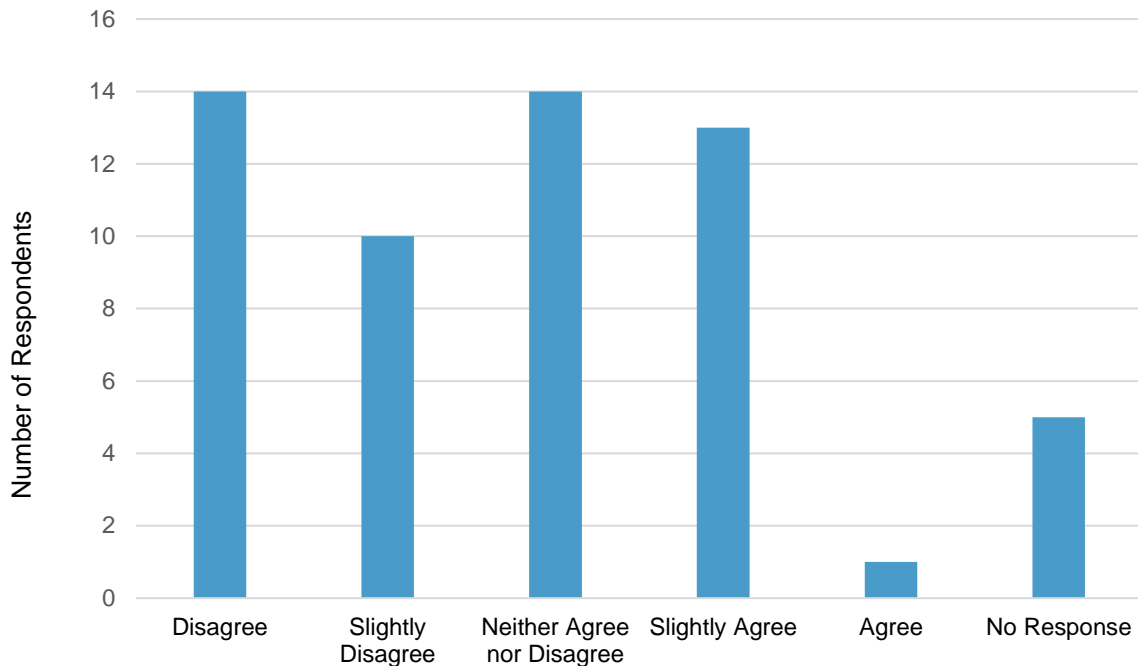


Figure 7. Frequency of agreement with the statement “It is difficult to assist with urban agricultural clients’ needs” ($n = 57$).

Table 5 shows the response frequencies and percentages to questions related to the availability of CES resources for training and assistance with urban agriculture. The barrier that reported the highest percentage of “agree” or “slightly agree” (50%) was “there is not enough need for it in my county” ($n = 28$). Statements relating to time, including “not enough time to assist with” (54.8%) or “to seek training” (49.1%) reported relatively higher levels of disagreement. Between 17.5% and 45.6% of respondents indicated they “neither agreed nor disagreed” with the statements. Five participants (8.8%) did not provide a response to any questions in the matrix.

Table 5

Level of Agreement with Statements Regarding CES Resource Availability for Urban Agriculture (n = 57)

Question	Frequency and Percentage of Likert-Type Responses											
	No Response		Disagree		Slightly Disagree		Neither Agree nor Disagree		Slightly Agree		Agree	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
There is not enough CES funding to support urban agriculture.	5	8.8	10	17.5	9	15.8	23	40.4	8	14.0	2	3.5
I do not have enough time to assist urban agriculture farmers.	5	8.8	21	36.8	10	17.5	10	17.5	9	15.8	2	3.5
I do not have enough time to seek training about urban agriculture.	5	8.8	20	35.1	8	14.0	12	21.1	9	15.8	3	5.2
There is not enough need for it in my county.*	5	8.8	8	14.0	6	10.5	10	17.5	10	17.5	18	31.6
I have enough time, but not enough CES funding to support urban agriculture farmers.	5	8.8	13	22.8	9	15.8	26	45.6	4	7	0	0.0
I have enough CES funding, but not enough time to support urban agriculture farmers.	5	8.8	13	22.8	10	17.5	26	45.6	0	0.0	3	5.3

Note. Statements marked with an asterisk (*) were found to have significantly different responses between two or more regions within the sample.

Table 6 provides the response frequency and percentage to statements about urban agriculture programs in participants' counties. Of the 57 participants, 18 (31.8%) "agreed" or "slightly agreed" that there were urban agriculture programs in their counties, while 21 participants (36.7%) "disagreed" or "slightly disagreed" with that statement (Table 6). Of the participants that indicated there were programs in place, 13 participants (22.8%) responded that clients were unaware of them, but 31.6% indicated they "neither agreed nor disagreed" with this statement, which demonstrated significant differences between regions within the population (Table 8). Thirty participants (53%) "agreed" or "slightly agreed" that they had interest working with urban farmers, while four (7%) indicated the opposite.

Table 6

Level of Agreement with Statements Regarding Urban Agriculture Programs in Participants' Counties (n = 57)

Question	Frequency and Percentage of Likert-Type Responses											
	No Response		Disagree		Slightly Disagree		Neither Agree nor Disagree		Slightly Agree		Agree	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
There are urban agriculture programs in place in my county.*	6	10.5	18	31.6	3	5.2	12	21.1	9	15.8	9	15.8
There are no urban agriculture programs in place in my county.*	7	12.3	11	19.3	9	15.8	10	17.5	3	5.3	17	29.8
There are urban agriculture programs in place in my county, but clients are unaware of them.*	6	10.5	14	24.6	6	10.5	18	31.6	13	22.8	0	0.0
I have interest in working with urban agriculture farmers.	6	10.5	2	3.5	2	3.5	17	29.8	13	22.8	17	29.8
I have no interest in working with urban agriculture farmers.	6	10.5	22	38.6	12	21.1	13	22.8	2	3.5	2	3.5

Note. Statements marked with an asterisk (*) were found to have significantly different responses between two or more regions within the sample.

Participants were asked to indicate the likelihood with which they would work with potential programs for urban agriculture. Figure 8 displays the frequency with which participants

indicated they were “likely” or “very likely” to work with various programs, including, but not limited to, educational workshops, face-to-face communication, and on-site farm demonstrations. Agents were most likely to engage with face-to-face communication (73.7%), followed by on-site farm demonstrations (66.7%), educational workshops (64.9%), and meetings (64.9%). Participants were least likely to engage with online learning modules (35.1%).

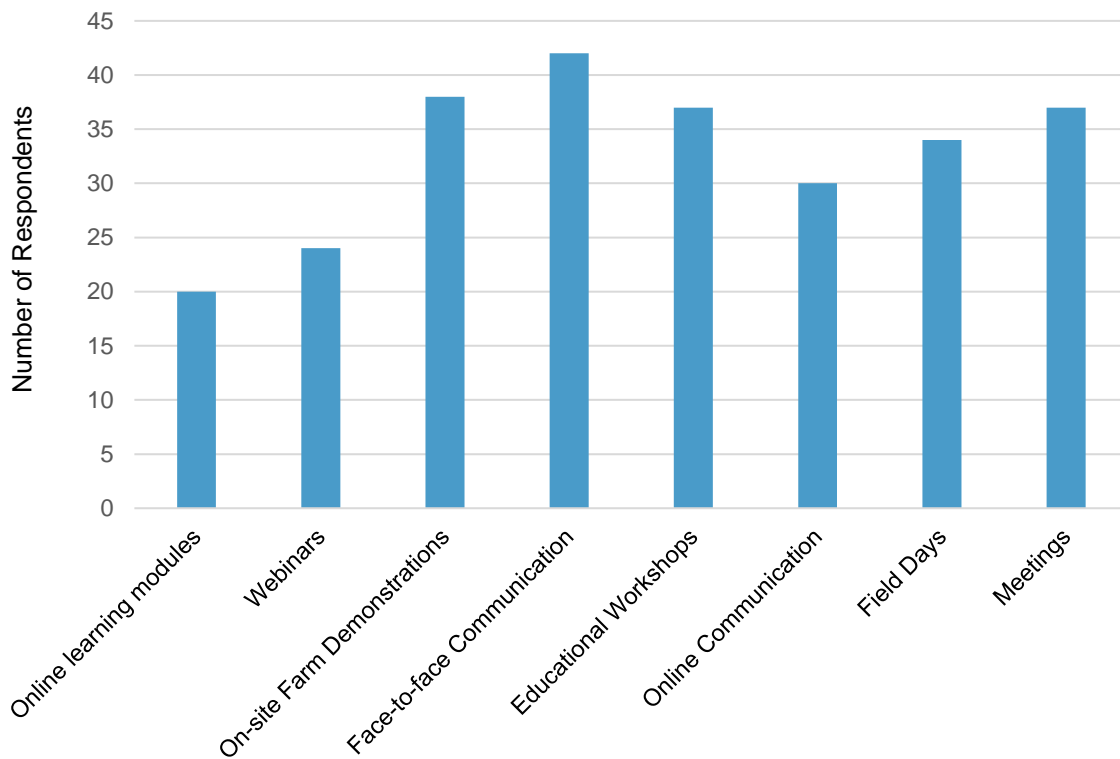


Figure 8. Frequency of reported likelihood (reported as “likely” or “very likely” on a Likert-type scale) of implementing or working with various types of programs for urban farmers ($n = 57$).

The last item on the questionnaire asked participants an open-response question, “what types of training would be helpful for you to assist with urban agriculture?”. Of the 10 participants who provided a response, usable responses included, “any”, “web-based learning”, “IPM”, “marketing”, “vegetable production”, and “hands-on in-services and fact sheets”.

Differences between agent perceptions in metropolitan and non-metropolitan areas.

Responses in this section relate to research objective 5, to determine if responses of CEAs in counties serving predominately-metropolitan areas differ significantly from the responses of CEAs in counties serving non-metropolitan areas. Participants were asked to indicate the region, from a color coded map, that included the county in which they worked for CES (Figure 9). Counties were grouped this way to protect anonymity of the responses, since some counties only have one agricultural CEA. The color regions were developed so similar county populations were grouped to form a region (Table 7).

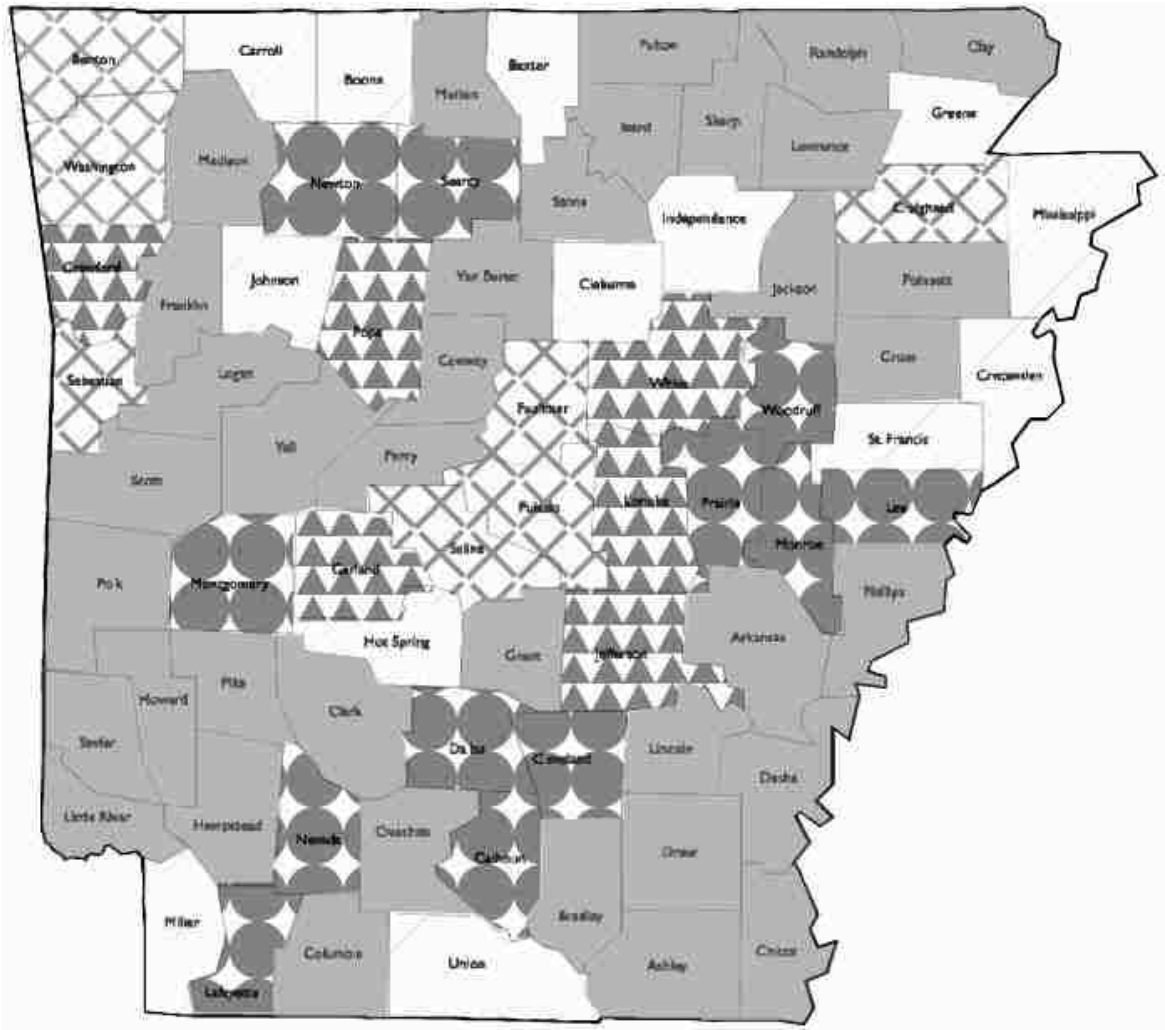







Figure 9. The above map was used in the survey for participants to indicate what pattern group contained the county in which they worked for CES.

Table 7

Participant County Identification Based on Figure 9 (n = 57)

Pattern Region	Counties in Region	Population Range	n	Percentage
 X	Benton, Craighead, Faulkner, Pulaski, Saline, Sebastian, Washington	99,920 - 388,953	11	19.3
 Triangle	Crawford, Garland, Jefferson, Lonoke, Pope, White	61,943 - 96,889	4	7.0
 Line	Baxter, Boone, Carroll, Cleburne, Crittenden, Greene, Hot Spring, Independence, Johnson, Miller, Mississippi, St. Francis, Union	25,788 - 50,088	9	15.8
 Grey	Arkansas, Ashley, Bradley, Chicot, Clark, Clay, Cleveland, Columbia, Conway, Cross, Dallas, Desha, Drew, Franklin, Fulton, Grant, Hempstead, Howard, IZard, Jackson, Lawrence, Lee, Lincoln, Little River, Logan, Madison, Marion, Montgomery, Nevada, Ouachita, Perry, Pike, Phillips, Poinsett, Polk, Randolph, Scott, Sevier, Sharp, Stone, Van Buren, Yell	8,639 - 25,389	10	17.6
 Circle	Calhoun, Dallas, Lafayette, Monroe, Newton, Prairie, Searcy, Woodruff	5,317 - 8,462	19	33.3
No Response			4	7.0

A Kruskal-Wallis test was used to determine any potential differences between the participant responses in the five regions analyzed. Significant differences ($p < 0.05$) between regions were found when participants were asked their agreement with various statements relating to perceptions of, awareness of, and barriers to working with urban farmers in their counties. Table 8 displays the statements to which there were significant differences between participant responses by color region. For nine statements, pattern regions Grey (second lowest

county populations) and X (highest county populations) demonstrated significant differences (Table 8). Triangle (second highest county populations) differed significantly with Grey (second lowest county populations) on three statements (Table 8). Circle (lowest county populations) differed significantly with X (highest county populations) on two statements (Table 8).

Table 8

Kruskal-Wallis Nonparametric Findings for Significant Differences in Responses based on County Color Region

Statement	Significantly Different Groups	<i>p</i>
Please indicate the level to which the small-scale, diversified farms in your county practice crop rotation.	Triangle, Grey Triangle, X	0.035 0.016
How would you describe the concentration of urban agriculture in your county?	Triangle, X	0.001
How often do you deal with clients needing assistance with urban agriculture?	Triangle, Grey	0.013
More time should be set aside for CES agent training in the area of urban agriculture.	Grey, X	0.034
It is difficult to assist with urban agricultural clients' needs because there is not enough need for it in my county.	Grey, X	0.000
There are urban agriculture programs in my county.	Grey, X Triangle, Grey	0.002 0.029
There are no urban agriculture programs in my county.	Grey, X	0.025
There are urban agriculture programs in place in my county, but clients are unaware of them.	Grey, X	0.035
Urban farmers in my county generally sell their products to local restaurants.	Grey, X	0.017
Urban farmers in my county generally sell their products to community supported agriculture (CSAs).	Grey, X Circle, X	0.010 0.014
Urban farmers in my county generally sell their products to grocery stores.	Grey, X	0.046
Urban farmers in my county generally sell their products to schools.	Circle, X	0.037

To report nonresponse bias, the researcher followed recommendations from Johnson and Shoulders (2017). Early respondents (those who responded prior to the third mailing, $n = 40$) were compared to late respondents ($n = 17$), on three questions that represented each of the three constructs present in the survey: perceptions, awareness, and barriers. These responses were analyzed using a two-tailed independent t -test at the .05 alpha level. The effect size for the perceptions construct was $d = -0.642$ (a medium effect), the effect size for the barriers construct was $d = -0.084$ (a negligible effect), and the effect size for the awareness construct was $d = -0.021$ (a negligible effect). There were no significant differences between early ($M = 1.58, SD = .844; M = 2.33, SD = 0.309; M = 2.25, SD = 1.276$) and late ($M = 2.18, SD = 1.131; M = 2.35, SD = 1.498; M = 2.35, SD = 1.115$) respondents for any of the three constructs, $t(57) = -2.218, -.071, -.289; p = .168, .311, .395$. Thus, the findings were generalized to the population.

Conclusions, Implications, and Recommendations

Results of this study provided several key insights about Arkansas' county agricultural agents' perceptions and awareness of urban farming in their counties. Previous studies (Dobbins et al., 2019; Perez & McCullough, 2017) have provided insight to the needs of local and urban producers in Arkansas, but this study aimed to bridge the gap between literature that addressed producer needs with understanding agents' perceptions. These key findings revealed that agents in less populous regions of Arkansas have differing perceptions and awareness of urban farming as it relates to barriers, markets, programs, resources, and clients.

Many participants (65%) agreed with "farming in and around urban areas" as a definition of urban agriculture, as well as "farming within city limits" (60%), which are both definitions supported by the general literature about urban agriculture. Participants (56%) also tended to agree with the definition "small farms (fewer than 10 acres) located within city limits that

actively engage with the market either through direct-to-consumer sales, coordinator, or institutional/retail buyers”, which was an operational definition of constructed by the researcher in a previous study specifically for Arkansas (Dobbins et al., 2019). However, that same study constructed an evolved definition of urban farming in Arkansas as “small-scale, fewer than 10 acres, diversified, and sustainable farming within city limits that engages with the market, the community, or both” (Dobbins et al., 2019). The findings of the current study support this definition through the perspective of CES’s agricultural agents, as 72% of participants supported the inclusion of “farming that involves community” as a definition of urban agriculture.

Other findings related to participants’ perceptions of urban agriculture related to concentration in their counties. Arkansas is a predominately-rural state, and responses to the question “Are there small-scale, diversified farms in your county?” resulted in 61.4% agreement, though this question did not identify whether the farms in question were urban or not. However, when participants were asked to describe the concentration of urban agriculture in their counties (defined as “small-scale, diversified farms less than 10 acres inside the city limits selling and producing for markets”), 73.2% indicated the concentration was “low” or “non-existent”. Thus, when the term “urban agriculture” compounded the description of “small-scale, diversified farms less than 10 acres inside the city limits selling and producing for markets”, participants reported a lower concentration than when the term “urban agriculture” was not present as a qualifier. This could possibly be attributed to the rurality of many of the counties in which participants work. Of the urban farms identified by participants, most were described to use medium-to-low levels of sustainable practices, which contradicts previous literature about urban agriculture that indicates high use of sustainable practices among urban farmers in the Northwest and Central regions of Arkansas (Dobbins et al., 2019).

Participants were asked to identify any benefits they have observed from urban agriculture in their counties. A majority of participants indicated that they had not observed any benefits, but the 16 participants (28.1%) of participants who had observed benefits identified increased access to healthy food most frequently. This supports Rogus and Dimitri's (2014) notion that urban agriculture can enhance community food security, which includes access to healthy food. Opportunities for increasing the observable benefits of urban farms and urban agriculture in communities can help enhance collaboration and communication of these farms with agents in the area, as well as community members who could benefit from the programs.

Questions aimed at determining the awareness of participants regarding urban agriculture included knowledge of where urban farmers sold their products. The highest reported location for this section was farmers' markets (61.4%), followed by on-farm or direct-to-consumer sales (42.1%). This study did not, however, have a way of validating these responses because individual data about which counties participants were referencing were not collected, only regional data. Findings from Dobbins et al. (2019) indicated that in the Northwest and Central regions of the state, two of the top three markets for urban agricultural products included farmers' markets and on-farm/direct-to-consumer sales. This indicates that agents in Arkansas have a good understanding of potential markets for urban farmers in the state. This concept relates to the Builder, Weaver, and Warrior Work theory (Stevenson et al., 2007) and corroborates Clark et al.'s finding (2017) that agents view the marketplace as a mechanism for local food system change.

Participants indicated some lack of awareness about issues affecting urban farmers. While the top three most frequent responses matched the needs of urban farmers from literature and previous studies (Dobbins et al., 2019), the fourth most cited response, "commercial-use

pesticides”, was a response that was not supported by the literature included to determine if participants would select responses that did not reflect the needs of urban farmers. A limitation of this was that the survey did not control for misinterpretation of these responses. While they were written implying that urban farmers generally do not use conventional commercial-use pesticides (as most use commercial-use organic pesticides) participants may have interpreted this to mean issues with neighbors or neighboring farms using commercial-use pesticides that may interfere with sustainable practices on urban farms. Future research using this instrument should provide definitions or explanations of these terms to limit potential misunderstandings. Additionally, future research should corroborate this question by testing it with urban farmers, since this question was informed by qualitative data. The researcher cannot conclusively determine the knowledge as compared to the levels of responses for each item by urban farmers since that data only exists in qualitative form.

Few participants reported that they assisted urban agricultural clients “weekly” (10.5%) or “monthly” (22.8%), though 74.0% of participants indicated a belief that “CES is a valuable resource for urban farmers”. Overall, 62.0% of participants agreed “CES should provide more urban agriculture resources”. This demonstrates a gap between beliefs, values, and implementation/practice. Data describing the preferred program types by participants (face-to-face communication and on-site farm demonstrations) align with previous findings that urban farmers preferred these modes of programming as well (Dobbins et al., 2019). This triangulation should provide baseline data for future programming to connect CES with this urban farming population. Out of the 57 participants, 41 (71.9%) indicated they perceived themselves as “not knowledgeable at all” or “slightly knowledgeable” about urban farming. Conversely, 40.3% of participants indicated that they were “confident” or “very confident” of their ability to advise and

assist urban agricultural clients' needs. Future research should investigate this discrepancy to discover why agents report little knowledge of urban agriculture but higher confidence in assisting urban farmers.

As 42.1% of participants “disagreed” or “slightly disagreed” with the notion that it is difficult to assist urban farmers, there is potential for increased collaboration between CES and urban farmers, though this collaboration will vary based on region. While these participants disagreed slightly with the difficulty of assisting urban farmers, 50% “agreed” or “slightly agreed” with the statement “there is not enough need for it in my county”. As 66.6% of participants were from counties with populations 50,000 or below, generally the more rural counties, this may be an indicator of how the rurality of a state affects urban farming growth. Urban farming in a predominately-rural state is not expected to be a major phenomenon, but future research in the state could expand upon this survey to gauge the use of alternative or sustainable farming practices, which may capture a wider audience than a survey aimed at urban agriculture. This is a limitation to the study—some potential participants may have seen the survey used the term “urban agriculture”, which could have contributed to non-response or attrition. While non-response bias was analyzed by comparing early to late respondents, this may not capture potential bias between respondents and true non-respondents.

County agents who participated in this study demonstrated a lack of understanding the scope of urban and diversified agriculture in their counties. They also demonstrated a lack of understanding the scope of the needs of their clientele who work in the urban agricultural sector. The researcher recognizes that perceptions of urban agriculture are difficult to capture in rural areas where respondents do not associate their production methods with the term “urban”, which may have biased the results of this study. Future research should aim to capture perceptions of

rural county agents of sustainable or alternative farming methods in use in their counties. As Dobbins and colleagues (2019) demonstrated that the majority of urban farmers in Arkansas utilized sustainable growing practices, though the participating agents in this study did not reflect that finding. Capturing this data would be a way to bridge the gap between sustainable growers and CES in a predominately-rural, conventional agricultural state.

Implications for practice include understanding the perceptions and awareness of agricultural agents regarding urban and sustainable agriculture. This is a growing aspect of the agricultural sector, often populated in Arkansas by people with non-traditional agricultural backgrounds (Dobbins et al., 2019), who may or may not understand the full array of services and resources available to them through CES. In order to better market programs to this population, understanding the baseline data of perceptions, awareness, and barriers of CEAs will help with future programming in urban, sustainable agriculture.

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Appendix C

Survey Consent Form



Department of
Agricultural Education, Communications
and Technology



Date

Dear Cooperative Extension Service Agent:

My name is Katie Dobbins and I am a Master's student at the University of Arkansas in the Agricultural and Extension Education program. I am writing to ask for your help with a survey I am conducting with Arkansas' agriculture county Extension agents' perceptions of diversified small-farming operations and urban agriculture. Thank you in advance for providing your input.

If you agree to participate in this brief survey, approximately 10 minutes, simply follow this link:

This survey is confidential. Your individual answers will not be linked with your name in any reports of the data. Your participation is voluntary. If you come to a question you prefer not to answer, you may skip it and proceed to the next question. Should you have any questions, comments, or concerns, please contact me at cedobbin@uark.edu or Casandra Cox, my thesis director, at ccrumle@uark.edu or (479) 575-2035.

We appreciate your help with this study.

Many thanks,

Katie E. Dobbins, Graduate Student
Department of Agricultural and Extension Education
University of Arkansas
D112 Agriculture, Food and Life Sciences Building
Fayetteville, AR 72701
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Casandra K. Cox, Instructor
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Appendix D

IRB Approval Notice



To: Catherine Elizabeth Dobbins
From: Douglas James Adams, Chair
IRB Committee
Date: 12/06/2018
Action: Exemption Granted
Action Date: 12/06/2018
Protocol #: 1809143362
Study Title: Survey to Describe Perceptions of Urban Agriculture by Arkansas County Extension Agents

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at: 109 MLKG Building, 5-2208, or irb@uark.edu.

cc: Casandra Kay Cox, Investigator

Appendix E

Questionnaire



Thank you for taking the time to participate in this survey!

If you agree to participate in this brief survey, approximately 15 minutes, click the "Next" button. If at any point you need to revisit a question, click the "Back" button.

All information collected will be kept confidential to the extent allowed by law and university policy. Your individual answers will not be linked with your name in any reports of the data. Your participation is voluntary. If you come to a question you prefer not to answer, you may skip it and proceed to the next question. Should you have any questions, comments, or concerns, please contact me, Katie Dobbins, at cedobbin@uark.edu or Casandra Cox, my thesis director, at ccrumle@uark.edu or (479) 575-2035. IRB approval has been granted for this project (IRB protocol data here) and you may contact Ro Windwalker (iwindwal@uark.edu).

I appreciate your help with this survey. Thanks in advance for providing your input.

By clicking here, you provide consent to participate in this study.

- Yes, I consent to participate in this survey.
- No, I do not consent to participate in this survey.



Please indicate your level of agreement with the following descriptions of urban agriculture:

Urban agriculture can be defined as...

	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree
Farming in and around urban areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming within city limits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming that involves the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming that involves education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Production, distribution, and marketing of food and products in the metropolitan core and the surrounding edges	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Small farms (fewer than 10 acres) located within city limits that actively engage with the market either through direct-to-consumer sales, coordinator, or institutional/retail buyers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In your county, are there small-scale, diversified farms less than 10 acres selling and producing for markets inside the city limits?

- Yes
- No
- Unsure



If you answered no or unsure to the previous question, please describe the types of farming operations in your county.

Please indicate the level to which the small-scale, diversified farms in your county practice the following:

	Unsure	Low	Medium	High
Sustainable farming practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Certified Naturally Grown (CNG)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic (Certified)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic (Non-certified)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Permaculture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chemical-free	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No-till	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cover cropping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crop rotation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the following questions, urban agriculture is defined as small-scale, diversified farms less than 10 acres inside the city limits selling and producing for markets. Urban agriculture in this survey does not include gardening.

How would you describe the concentration of urban agriculture in your county?

Nonexistent	Low	Moderate	High	Extremely High
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How often do you deal with clients needing assistance with urban agriculture?

Never	Yearly	Monthly	Weekly	Daily
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your level of agreement with the following statements:

	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree
The Cooperative Extension Service (CES) is a valuable resource for urban agriculture farmers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CES should provide more urban agriculture resources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More time should be set aside for CES agent training in the area of urban agriculture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More funding should be set aside for CES agent training in the area of urban agriculture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CES should not focus on developing programs related to urban agriculture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your level of agreement with the following statement:

It is difficult to assist with urban agricultural clients' needs.

Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your level of agreement with the following:

It is difficult to assist with urban agricultural clients' needs because...

	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree
There is not enough CES funding to support urban agriculture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not have enough time to assist urban agriculture farmers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not have enough time to seek training about urban agriculture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is not enough need for it in my county.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have enough time, but not enough CES funding to support urban agriculture farmers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have enough CES funding, but not enough time to support urban agriculturalists.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please describe any additional difficulties associated with assisting urban agricultural clients' needs.

Please indicate the level to which you agree with the following:

	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree
There are urban agriculture programs in place in my county.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are no urban agriculture programs in place in my county.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are urban agriculture programs in place in my county, but clients are unaware of them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have interest in working with urban agriculture farmers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have no interest in working with urban agriculture farmers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate how likely you would be to implement or work with the following programs with urban agriculturalists:

	Not at all likely	Not very likely	Neither likely nor unlikely	Likely	Very likely
Online Learning Modules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Webinars	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On-site farm demonstration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Face-to-face communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational workshops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Have you observed any of the following benefits as a result of urban agriculture in your county? (Check all that apply)

- Increased food security (access to sufficient quantity of affordable, nutritious food)
- Increased access to healthy food
- Improved local economy

Please describe any additional benefits resulting from urban agriculture/small-scale diversified agriculture in your county.

Where/how do urban farmers in your county generally sell their products?

	Never	Not often	About half of the time	Often	Always
Local restaurants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farmers' Market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community Supported Agriculture (CSA) (Individuals who support local farmers through subscriptions sold prior to season yielding weekly deliveries of fresh produce)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grocery stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On-farm/direct-to-consumer sales	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Schools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How knowledgeable are you of urban agricultural clients' needs and concerns?

Not knowledgeable at all	Slightly knowledgeable	Moderately knowledgeable	Very knowledgeable	Extremely knowledgeable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How confident are you in your ability to assist clients with urban agriculture needs?

Not confident	Somewhat confident	Neither confident or not confident	Confident	Very confident
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Check all of the following that relate to the needs of urban agriculture farmers:

- Pricing of products
- Pest management
- Non-profit management
- Soil Quality
- Overspray
- Commercial-Use pesticides
- Start-up loans and grants
- Equipment sharing/Cooperatives

Please use the space provided below to provide any additional comments you feel are important to know about urban agriculture in your county.



Appendix F

Participant Recruitment Email

Agriculture Agent Survey Request Inbox



Katie Dobbins <noreply@qualtrics-survey.com>

3:25 PM (0 minutes ago)



to Katie

Hello!

My name is Katie Dobbins and I am a graduate student at the University of Arkansas in the Agricultural Education, Communications and Technology department. You are invited to participate in a survey about Arkansas agricultural Extension agents' perceptions of small-scale, diversified farming operations.

The survey will take approximately 15 minutes.

To participate in the survey, please use this link:

Follow this link to the Survey:

[Take the Survey](#)

Or copy and paste the URL below into your internet browser:

https://uark.qualtrics.com/jfe/form/SV_dpzeD1dE52wfkZD?Q_DL=d0zsCbMcgionWCx_dpzeD1dE52wfkZD_MLRP_a3sDEFIAppvfiP&Q_CHL=email

The deadline for completing the survey is **February 28th, 2019**.

You can contact me at cadobbins@uark.edu with any questions you may have. My thesis advisor, Casandra Cox (ccrumile@uark.edu), may also answer any further questions. IRB approval has been granted for this project (#1809143362) and you may contact Ro Windwalker (rwindwal@uark.edu) with any questions you may have about the IRB process.

Your time and participation are appreciated.

Kind regards,
Katie Dobbins

Department of Agricultural Education, Communication and Technology
University of Arkansas

Follow the link to opt out of future emails:

[Click here to unsubscribe](#)

Chapter IV: Overall Conclusions and Recommendations

The two articles in this thesis investigated the needs of urban farmers in Arkansas and the awareness and perceptions of Arkansas CEAs toward urban agriculture. This mixed-method assessment utilized 16 semi-structured, in-depth interviews with urban farmers in Northwest and Central Arkansas, as well as a survey with a 20-item questionnaire analyzing the perceptions, awareness, and experiences of Arkansas agricultural CEAs with urban agriculture. These studies aimed to understand Arkansas urban farmers and CES agents in relation to urban farming and built upon previous Arkansas local food systems research by Perez and McCullough (2017).

A gap has existed between urban farmers and CES. CES has traditionally worked with small farms, but urban farming is unique, and these producers have specific needs that require investigation (Hendrickson & Porth, 2012; Rogus & Dimitri, 2014). By utilizing the needs assessment model to investigate this phenomenon, the researcher will provide CES information about the Arkansas urban farming community, specifically highlighting any gaps or deficiencies (Seevers & Graham, 2012). This study aimed to identify specific need areas and to understand the perspectives and experiences of urban farmers and agricultural agents in the state, and provided recommendations for areas of potential programming and relationship building between urban farmers and CES in Arkansas. References to CES in this chapter refer specifically to the University of Arkansas Division of Agriculture CES, unless otherwise noted.

Chapter II: A Qualitative Needs Assessment of Arkansas Urban Farmers

The first article presents research conducted with Arkansas urban farmers. The purpose of this needs assessment was to investigate and identify the needs, including training and technical assistance, of urban farmers in Arkansas's urban areas. Building on the work of Perez and McCullough (2017), this study aimed to increase the contextual understanding of urban

agriculture in a predominately-rural state. The two theoretical frameworks that guided instrument development and data analysis were the Community Food System Development Framework for Change (Perez, 2016) and the Agro-Ecological Educator theory (Wight, 2013). Data were analyzed using structural thematic analysis (DeCuir-Gunby et al., 2011) which used Microsoft Word® and NVivo 11 used for coding.

Key findings.

A local definition of urban farming in Arkansas was developed as small-scale, fewer than 10 acres, diversified, and sustainable farming within city limits that engages with the market, the community, or both. This study identified several general needs for Arkansas urban farmers, such as market pricing resources, co-ops, access to appropriate equipment for small-scale farming, and maintenance of on-farm labor, but overall, the needs of participants were highly specific. Additionally, when participants were asked if they considered themselves as urban farmers, they did not primarily identify themselves as such, preferring instead the terms “producer”, “local farmer”, or “market gardener”. Participants also did not indicate that they had traditional agricultural experiences, making the exception themselves of gardening, which they did not associate specifically with agriculture.

Participants reported overall positive perceptions of CES regarding helpfulness, though they explained that CES did not have enough resources relevant to small-scale, sustainable farms. Most participants were also open to increased communication, specifically on-farm, and collaboration, for trainings, workshops, and programs with CES. Many identified individuals within CES with whom they had positive working relationships; thus, CES should utilize these individuals to build connections with and help market CES involvement with current programs and resources utilized by Arkansas urban farmers.

Chapter III: A Survey to Describe the Perceptions of Arkansas Agriculture County Extension Agents toward Urban Agriculture

The second article detailed the quantitative survey methods used to analyze CEAs perceptions, awareness, and experiences with urban agriculture in their counties. Because CES has potential to be a valuable, localized resource for Arkansas urban farmers (Reynolds, 2011), it is important to explore agents' perceptions of urban agriculture to collect baseline data for potential future programming. This study utilized Stevenson, Ruhf, Lezberg, and Clancy's (2007) theoretical framework, Builder, Weaver, and Warrior Work.

Key findings.

Key findings from this article demonstrated that CEAs in less populous regions of Arkansas have differing perceptions and awareness of urban farming as it relates to barriers, markets, programs, resources, and clients. This is important in understanding the context of urban farming in a rural state, which was a research question that guided data collection and analysis in the first article. The first article also constructed a definition of urban farming in the state, and the findings of the second article support this definition through analysis of the CEAs' responses indicating level of agreement with various definitions from the literature.

While the first article described a major use of sustainable practices by Arkansas urban farmers, the findings of the second article demonstrated that CEAs reported medium-to-low usage of sustainable practices in their counties, which contradicts the findings in the first study. This could be attributed to the responses from agents in less populous counties. Conversely, CEAs demonstrated a good understanding of where urban farmers sell their products, as their responses about markets aligned with data from the first article in which urban farmers described

where they sell their products. These markets included farmers' markets and on-farm or direct-to-consumers sales.

There seemed to be a gap between values and practice for agents that believed CES is a valuable resource for urban farmers (74.0%), as only 32.3% of respondents indicated that they assisted urban agricultural clients weekly or monthly. However, data relating to preferred program types by CEAs aligned with preferred program types by urban farmers (face-to-face communication and on-farm demonstrations), which presents potential areas for programming for Arkansas' urban farming population. There is potential for increased collaboration between CES and urban farmers, though this collaboration will vary based on region. As 66.6% of CEAs who participated in the survey were from counties with populations 50,000 or below, generally the more rural counties, this may be an indicator for how rurality in a state can affect urban farming growth.

Recommendations

Other states with a predominately-rural population are encouraged to conduct mixed-methods needs assessments with urban or sustainable producers and the county agents who could potentially provide them with information and resources. Not only do needs assessments provide CES personnel with valuable information, the act of data collection can also be a relationship-building tool. CES personnel should also use these needs assessments to determine a local definition of urban farming that will guide future program development.

Future research should aim to capture perceptions of rural county agents of sustainable or alternative farming methods in use in their counties. Perceptions of urban agriculture is difficult to capture in rural areas where respondents do not associate their production methods with the term "urban", which may have biased the results of this study. As Dobbins and colleagues (2019)

demonstrated that the majority of urban farmers in Arkansas utilize sustainable growing practices, capturing this data would be a way to bridge the gap between sustainable growers and CES in a predominately-rural, conventional agricultural state. In order to better market programs to Arkansas urban farmers, understanding the baseline data of perceptions, awareness, and barriers of CEAs and the farmers will help with future programming with urban, sustainable agriculture. This is a growing sector, often populated in Arkansas by people with non-traditional agricultural backgrounds (Dobbins et al., 2019), who may or may not understand the full array of services and resources available to them through CES. Utilizing key personnel within CES who have a positive working relationship with these farmers, which is already happening in some counties, would be one strong first step to bridging the gap between CES and urban farmers.

Concluding Remarks

Needs assessments allow trust to be built between CES and these populations, which increases the visibility and awareness of CES and could encourage increased participation for CES programs and usage of CES resources. Using this research and evaluation tool aids in bridging populations who have not traditionally worked together. Reynolds (2011) recommended that future relationships between CES and alternative food systems should be categorized by cooperation, dialogue, and co-learning, and needs assessments are a unique tool that allows the integration of all three of these concepts.

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