



# Urban, Small-scale, and Beginner Farmer Needs Assessment in Arizona

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## Introduction

A needs assessment is a formal process that allows one to compare the current outcomes of a situation to the desired outcomes (Stefaniak et al., 2015). This process allows one to make constructive change for the better, focusing on closing the gaps between what a group has versus what they need (Kaufman & English, 1979).

The needs of farmers continue to shift and change. Farms in Arizona are trending towards newer, smaller, and more urban operations; from 1997 to 2017, average farm size in Arizona decreased by 57% while the number of farms increased by 127% (USDA NASS, 2019). Currently, 50% of farms have less than ten acres of land in their operation, with 88% of the farms earning less than \$25,000 in annual sales (USDA NASS, 2019). Nearly one quarter (24%) of farmers are considered beginning farmers, meaning they have 10 years of operational experience or fewer (USDA NASS, 2019). A needs assessment was initiated in 2021 to understand what resources urban, small-scale, and beginner farmers in Arizona need to be successful. The results will help guide future programming to better align with these farming trends. In this needs assessment, we define urban farming as practices that include the production, distribution, and marketing of agricultural products within a metropolitan area, which is an area consisting of a large population nucleus and its surrounding communities (U.S. Census Bureau, 1994). Urban farming can also include community and school gardens, backyard and rooftop production, and production in vacant lots or parks. We define small-scale farms as having less than 50 acres and/or gross cash farm income under \$250,000/year and a beginning farmer as an individual who has been farming for 10 years or fewer.

The objectives of this assessment were to better understand the following:

- the demographics of the urban, beginner, and small-scale farming communities

- their agricultural experience and backgrounds
- what resources they need to create sustainable operations
- what barriers keep operations from moving forward
- what educational topics and Extension opportunities are of interest

To do so, the needs assessment consisted of a mixed-methods design approach (Creswell, 1999) including informal interviews, surveys, a focus group, and feedback solicited after an initial seminar for urban agriculture.

## Methods

The formative data collection phase consisted of key informant interviews to guide survey development. Semi-structured interviews (McIntosh & Morse, 2015) were conducted with five individuals who were actively engaged with existing Cooperative Extension farming programs to ensure that survey questions reflect and encompass the range of Arizona farmers' experiences. Using the information from interviews, a 23-question survey was then developed in both paper and electronic formats (see Appendix) using the tailored design method (Dillman et al., 2014). The survey was offered in English and Spanish; however, no one selected the Spanish option. The survey was distributed and promoted by community partners who shared it with their statewide listservs and social media, with special emphasis on partners whose efforts focus on refugee recruitment. The printed hard copies were distributed at farmers markets and posted on campus bulletin boards. The survey was circulated for three months, and responses were then compiled and analyzed using Qualtrics, a third-party online survey platform.

In addition to the survey responses, the findings were triangulated with qualitative focus group data and in-person feedback from a community seminar.

The focus group was held at a community garden with nine individuals who either grew in incubator farms or participated in programs supporting these farmers. These participants were asked to fill out the survey in person and then engage in open dialogue regarding their farming needs and what kinds of Extension programming would help them be successful. Then in October of 2021, the Urban Ag/Beginner Farmer program held its first seminar. At the conclusion of the seminar, twenty-one participants volunteered to fill out the survey and additional feedback was collected about topics the participants would like to have covered in future sessions.

## Results

In total, 179 individuals participated across all survey modes. Because respondents could skip any question, not every question received 179 responses. Some questions were also designed to allow respondents to select multiple answers, so the response total is over 179 for certain questions. The graphs are based on the percentage of unique respondents to each individual question.

Most participants were at least familiar with Cooperative Extension (73%), with 29% having participated in events or worked/partnered with Extension before. Importantly, more than a quarter of participants were less or completely unfamiliar with Extension (Figure 1).

Figures 2 and 3 capture the demographics of the survey participants. Most participants identified as White (68%); followed by Hispanic, Latino, or Spanish (11%); and then Black, African, or African American (8%). This demographic distribution includes slightly fewer White (77%), many fewer Hispanic (31%), and more African American (4.5%) respondents than were represented in Arizona’s 2019 ACS population. More participants identified female (49%) than male (46%), and 5% identified as non-binary /third gender or preferred not to say.

Participants indicated whether their farming operation is located on a tribal reservation, a metropolitan or urban area, or a rural area (Figure 4). Most farming operations were in a rural area (53%), followed closely by metropolitan or urban area (46%); only 1% indicated they were on a tribal reservation. Though efforts were made to reach the indigenous or Native American growers in Arizona, few responded to this survey. There are currently 18,475 indigenous farmers and ranchers in Arizona, and they make up 57% of the total agricultural operations (Arizona Department of Agriculture, 2018). Future surveys and data collection from Extension should work to reach these indigenous farmers and growers more intentionally.

One hundred nineteen respondents reported the zip code of their Arizona-based farming operation, mapped in

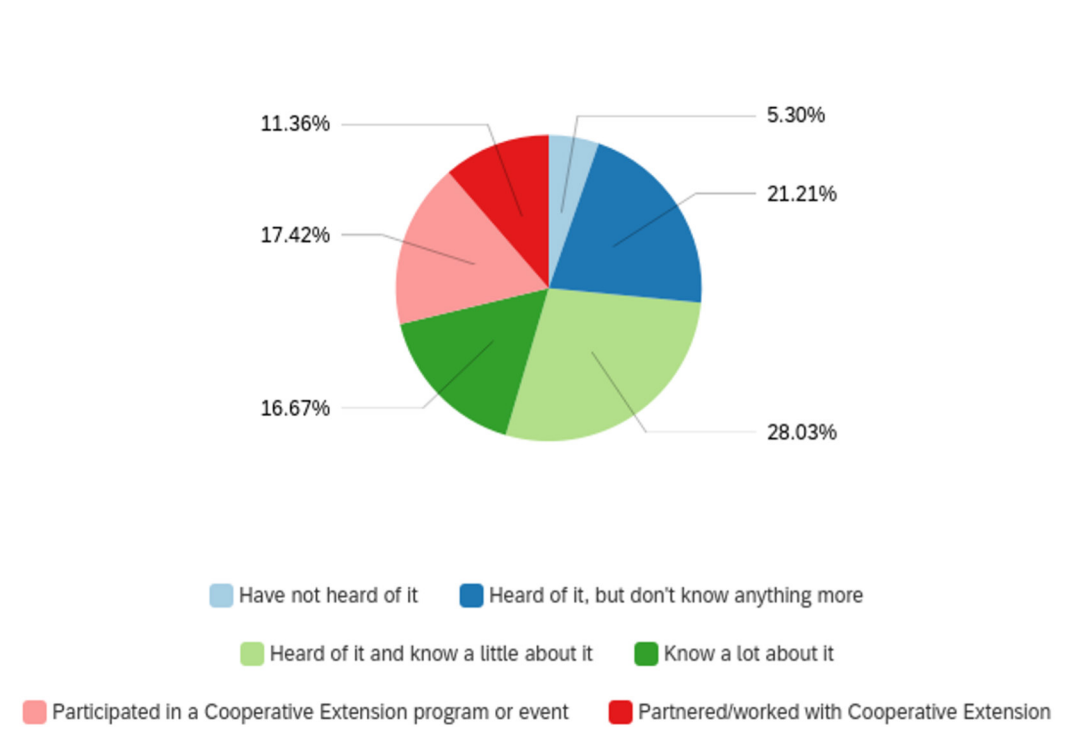


Figure 1. Familiarity with Extension programming (n=132).

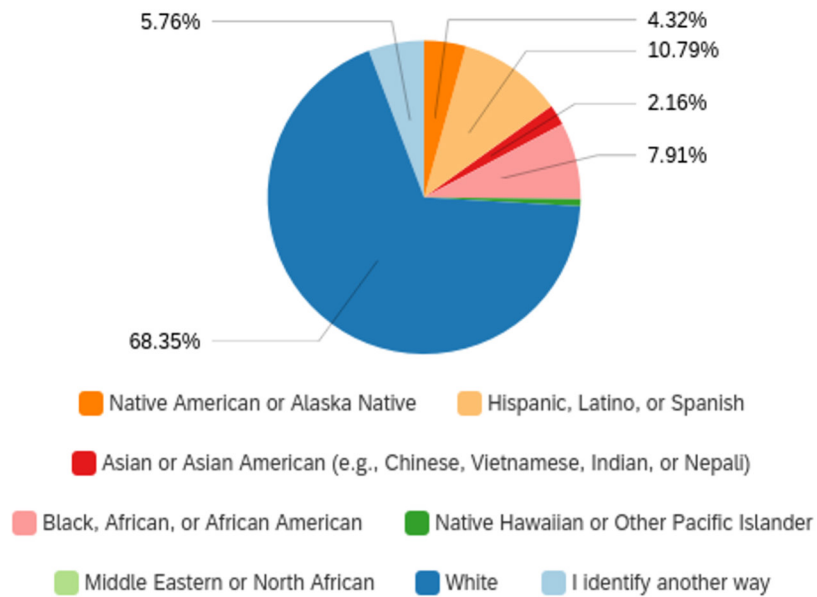


Figure 2. Race/ Ethnicity of survey respondents (n=139).

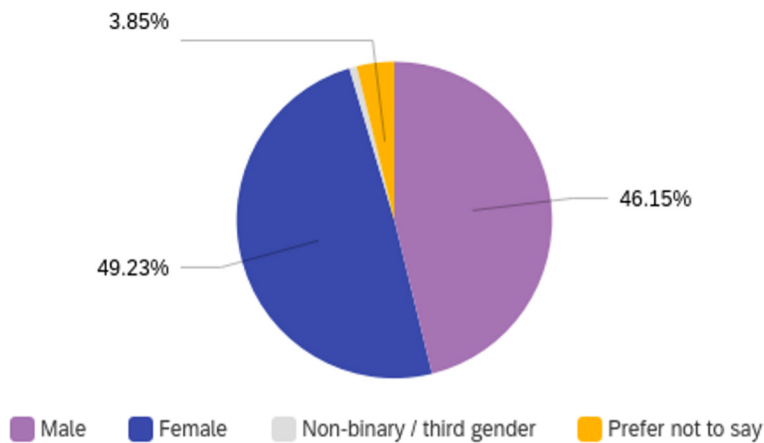


Figure 3. Gender identity of survey respondents (n=130).

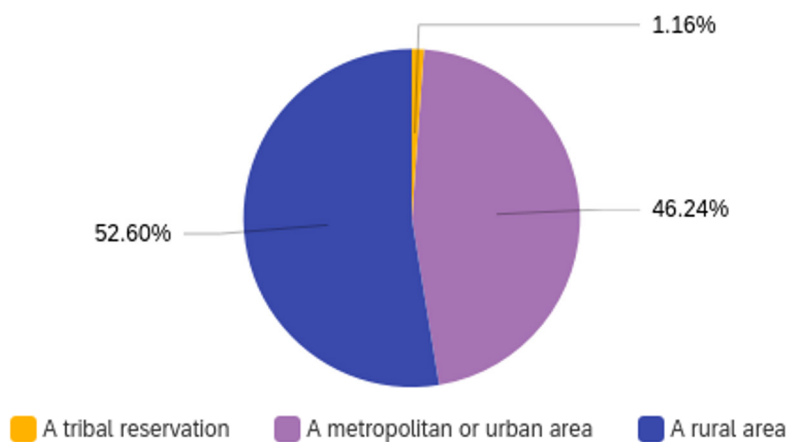


Figure 4. Farming operation location (n=173).

Figure 5 below. In the map, the base color of the county corresponds with the total number of responses in that county, and the red dots represent individual responses. There was at least one survey response in every county except for La Paz County. By far the most respondents had farms in Maricopa County (47%), where the survey was promoted the most and where 62% of the state's population resides (U.S. Census Bureau, 2019). Many respondents also had farms in Pima County (12%) and Cochise County (10%).

Respondents had low-acreage farms, which is in line with statewide trends. Figure 6 shows that 79% of

respondents are farming on less than 20 acres, and 60% are farming on less than 5 acres. Respondents were also newer to agriculture, with 58% indicating that they had been involved in agriculture for fewer than 10 years (Figure 7). Of the 68 respondents involved in urban agriculture, 80% were beginning farmers (Figure 8). Finally, just over one third of participants farm full-time (37%, Figure 9), with a slightly smaller portion farming part-time (36%, Figure 9). More than a quarter of participants are planning to start farming within the next 10 years (26%, Figure 9).

Figure 10 shows what farmers are producing in their operation. Most participants grow or plan to grow

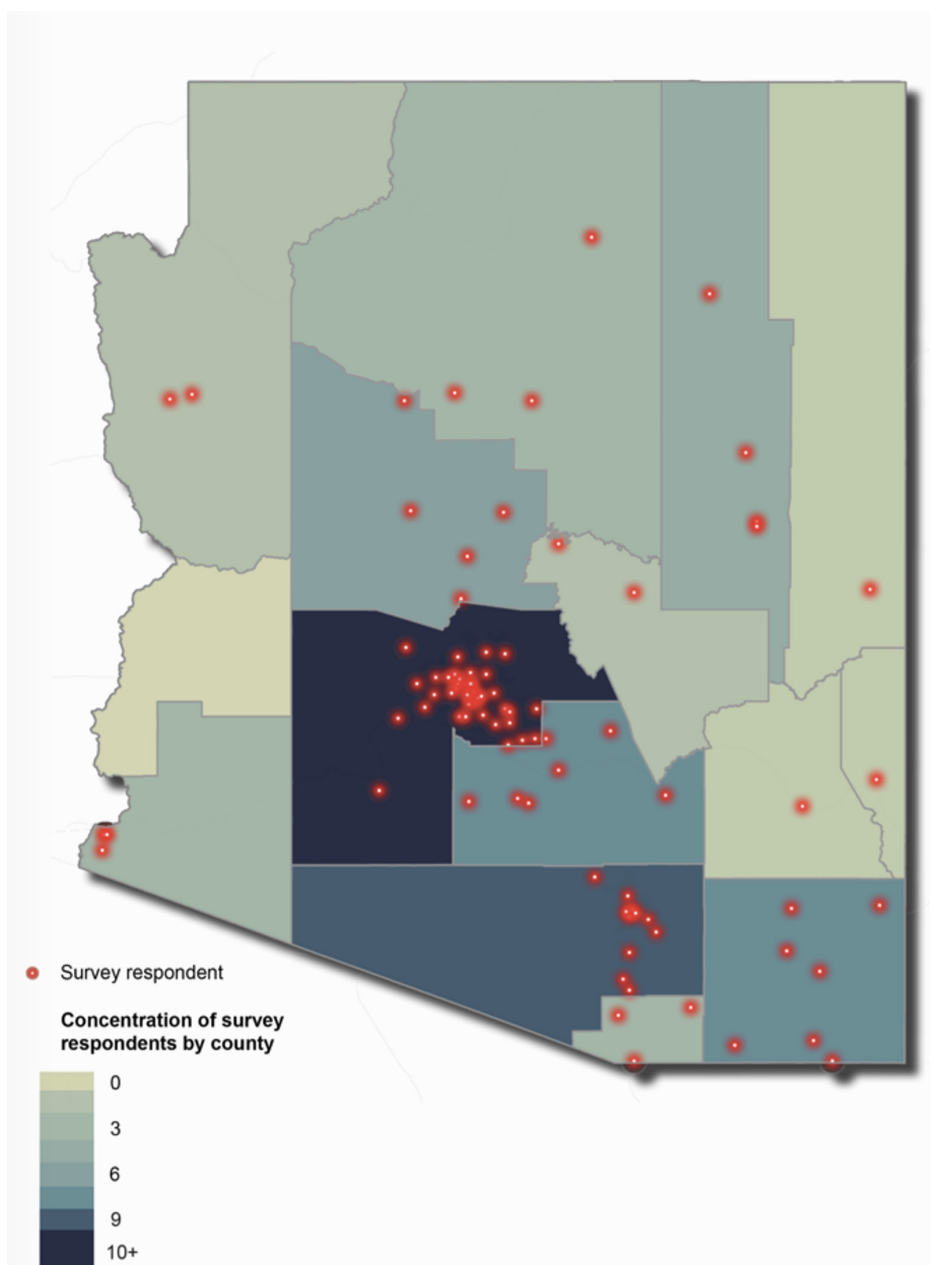


Figure 5. Zip code of respondents' farming operations (n=118).

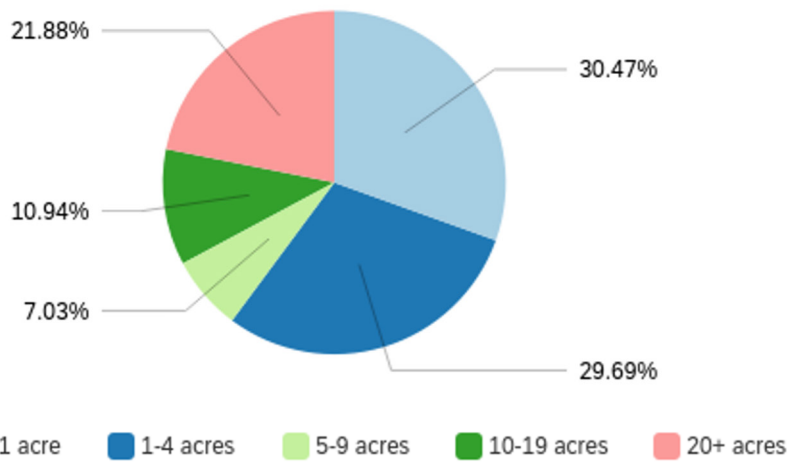


Figure 6. Farming acreage (n=128).

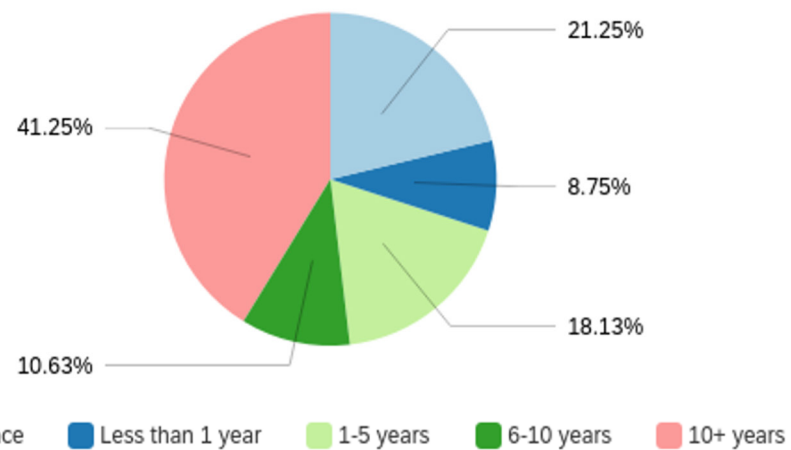


Figure 7. How long farmers have been involved in agriculture of any type (n=160).

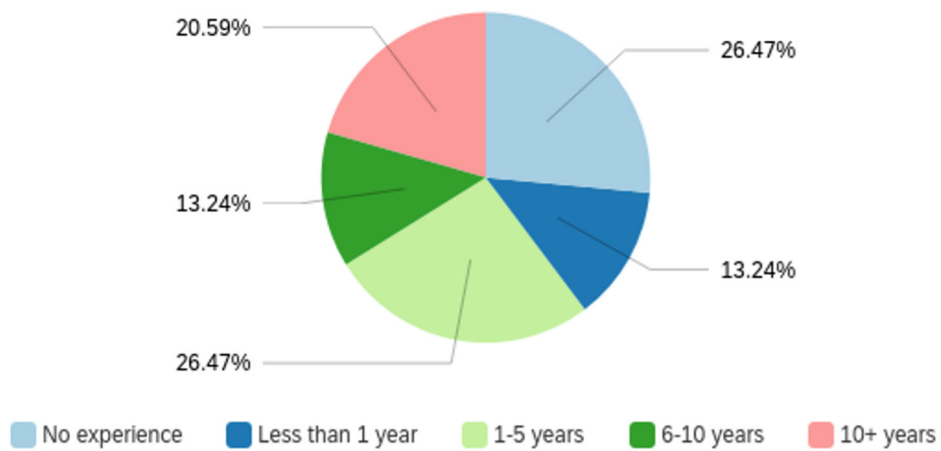


Figure 8. How long farmers have been involved in *urban* agriculture (n=68).

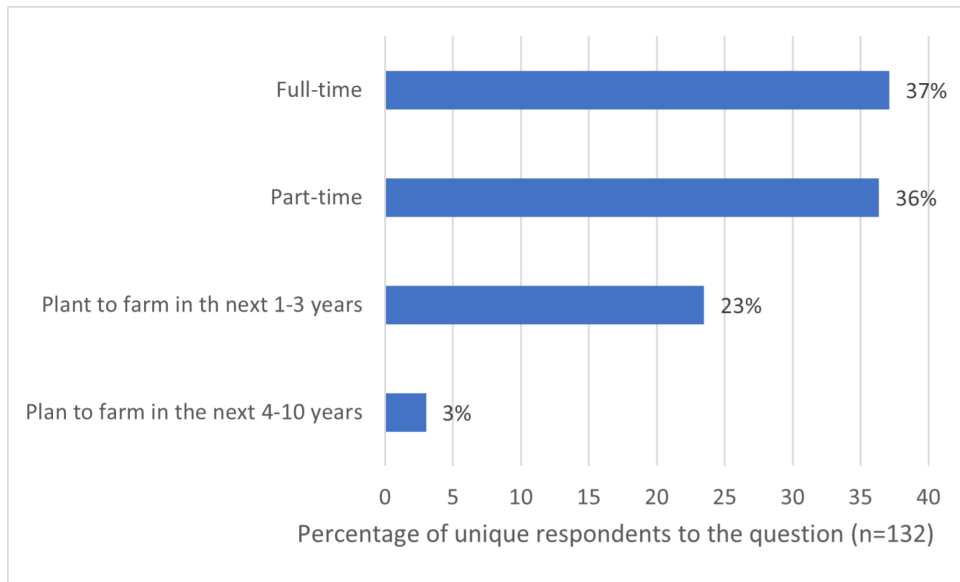


Figure 9. Farmers who farm full-time, part-time, or plan to start farming operations (n=132).

vegetables (75%) followed by fruits and nuts (53%), poultry (37%), and livestock (36%). Figure 11 shows what production methods are used for these products. Seventy-nine percent of participants indicated that they use in-ground beds, fifty-three percent used raised beds, and forty percent used greenhouses.

By and large, the most popular farming practice was following organic principles but not certified organic (46%, Figure 12), meaning that production does not use conventional fertilizers, pesticides, or herbicides (EPA, 2021). Biodynamic farming, meaning that production is aligned with natural processes, biodiversity, and cycles adapted to local conditions, was the next most popular category at twenty percent. Eleven percent of respondents

use conventional, and ten percent use certified organic methods.

Participants had a variety of reasons for farming (Figure 13) and indicated that they wanted to produce healthy food for the community (74%); produce healthy food for themselves and their family (72%); earn a living by farming (54%); and empower and educate their community (51%). Participants were most likely to sell at farmer's markets (Figure 14, 59%) or on their farm (48%). Fifty-two percent of respondents produce in a homestead capacity, meaning that they grow primarily for personal and family consumption.

Overall, the survey participants earned far below the \$250,000 threshold that designates a small-scale farmer

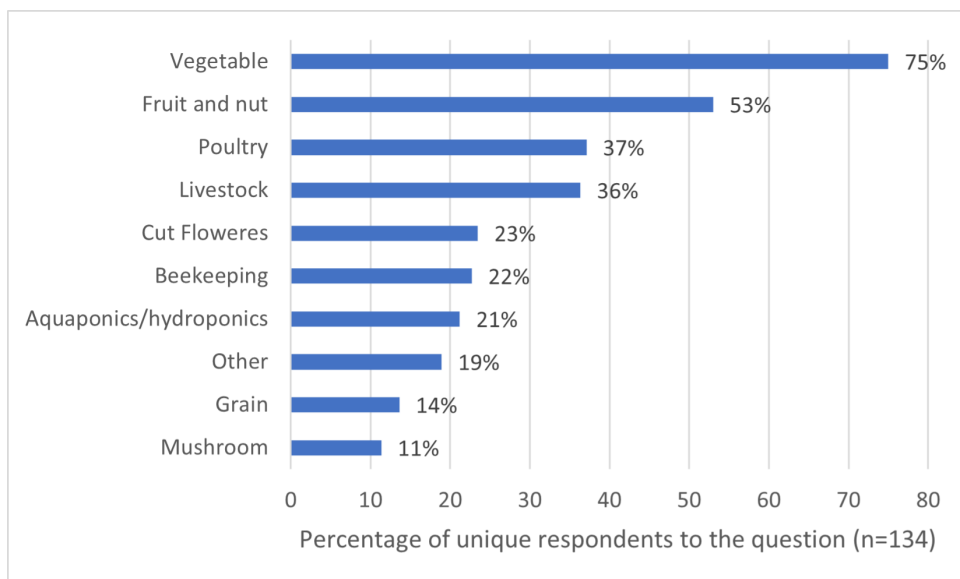


Figure 10. Farm production by category (n=134).

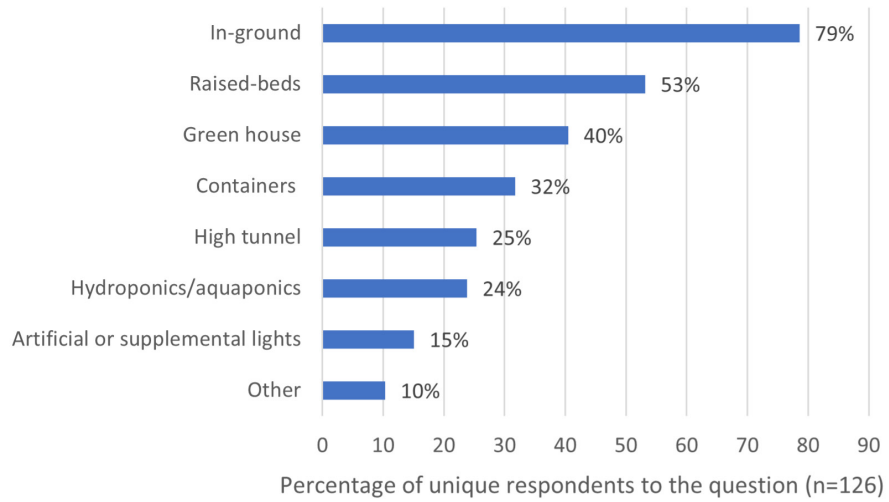


Figure 11. Production methods used on farms (n=126).

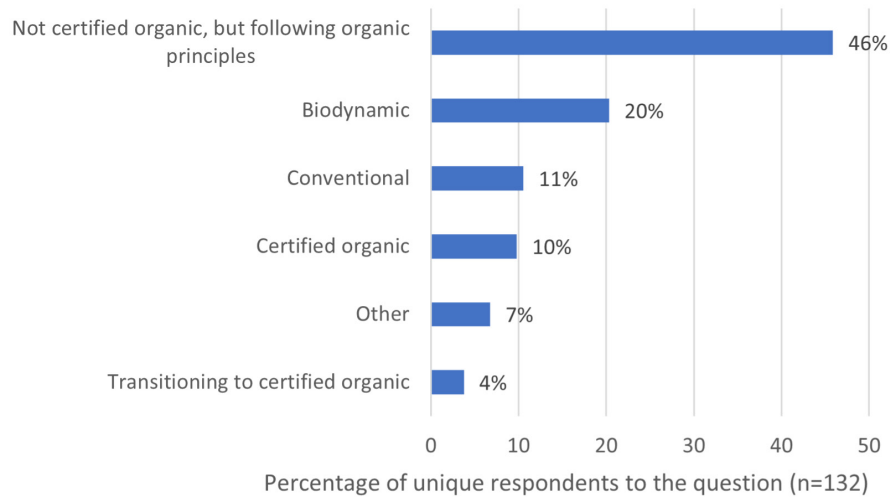


Figure 12. Farm practice used on farm (n=129).

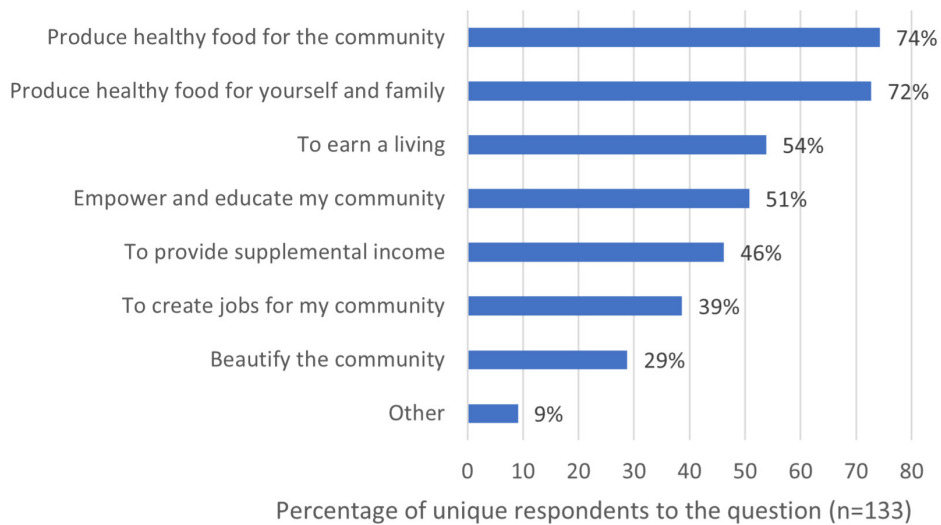


Figure 13. Goals farmers have for their operation (n=494).

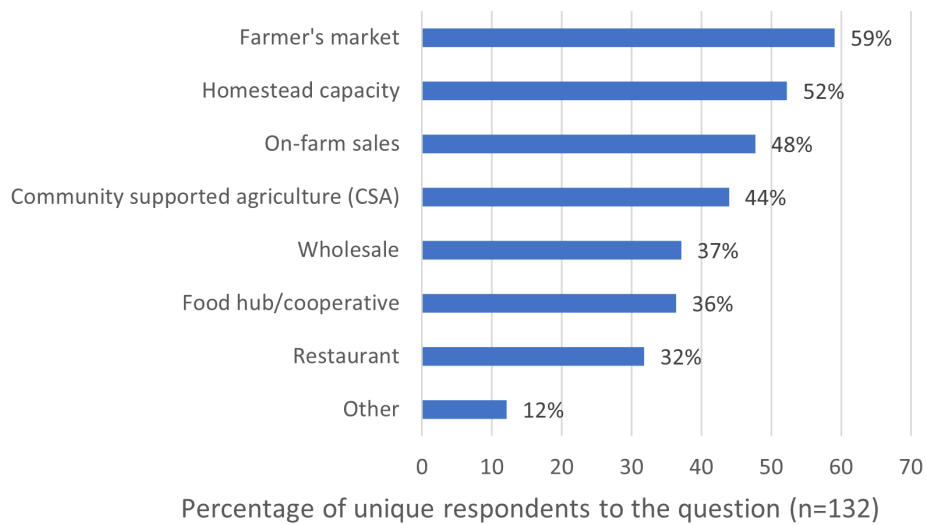


Figure 14. Top market choices for farmers (n=423).

(Figure 15). More than one quarter of participants earn less than \$5,000 a year (26%), 10% earn less than \$10,000 a year, 40% make between \$10,000 and \$99,999, and another quarter make \$100,000 or more per year. Only 10 individuals indicated that they made over \$250,000.

Participants indicated top barriers to their current or planned farming operation (Figure 16 and Figure 17). Drought, product distribution, processing and storage facilities, finding and entering profitable markets, and access to credit and financing were most frequently listed as moderate or extreme barriers. Language, technology, and livestock production information were not frequently indicated as barriers in this survey sample.

Farmers indicated the topics they would be most interested in learning more about through Extension programming (Figure 18). When ranked, participants were most interested in 1) soil management (43%), 2) composting and fertilization (42%), 3) farm financial management (41%), 4) high-tunnel and greenhouse management (39%), and 5) recordkeeping (38%), irrigation (38%), and marketing/advertising (n=50, 38%).

Figure 19 shows participants' preference for different educational modes. Nearly the same number of participants were interested in videos (64%), farm tours (63%), webinars (62%), and in in-person field days (61%). When asked if they preferred online, in-person, or a combination of both approaches, 62% chose a combined approach.

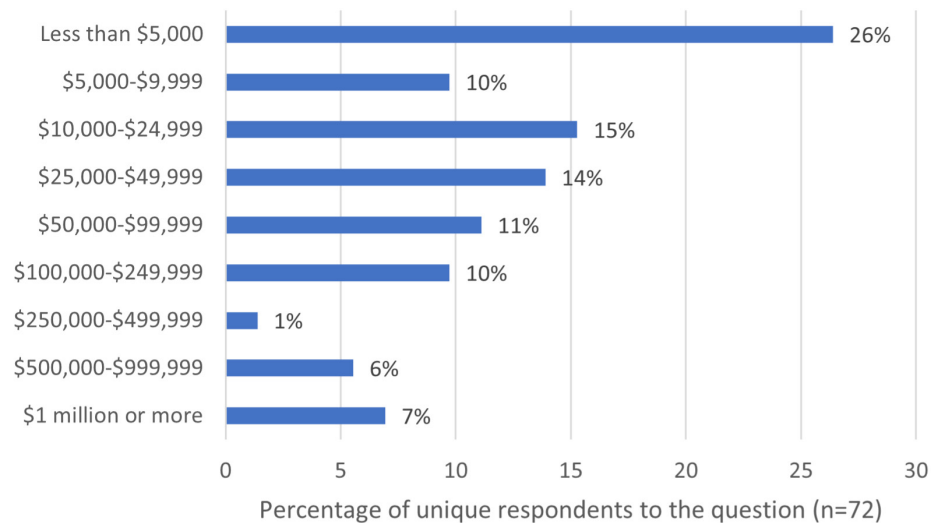


Figure 15. Annual farm revenue (n=72).



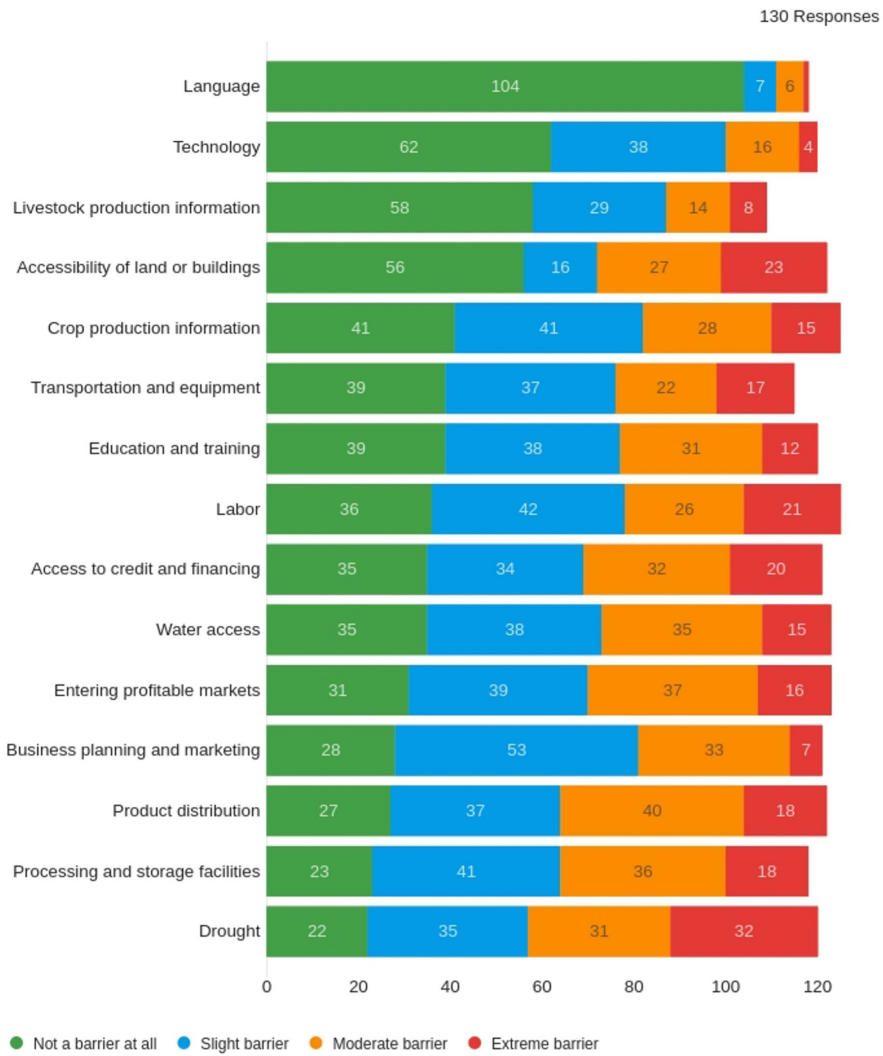


Figure 16. Identified barriers to farming operation (n=130).

#### Moderate to Extreme Barriers

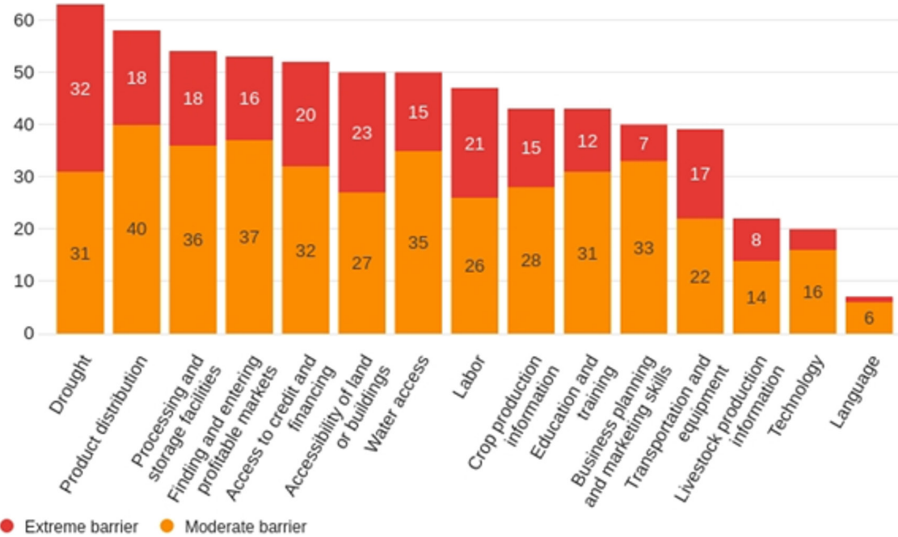


Figure 17. Combining “Moderate barrier” with “Extreme barrier” options to visualize most prominent barriers (n=130).

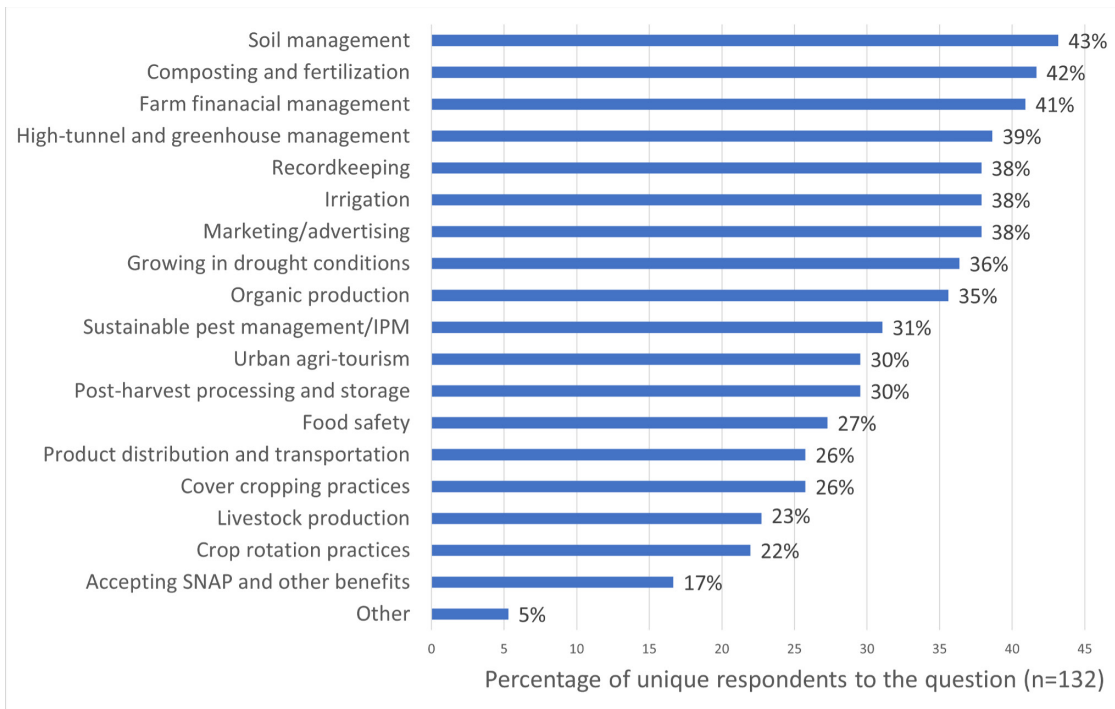


Figure 18. Ranked educational interests (n=771).

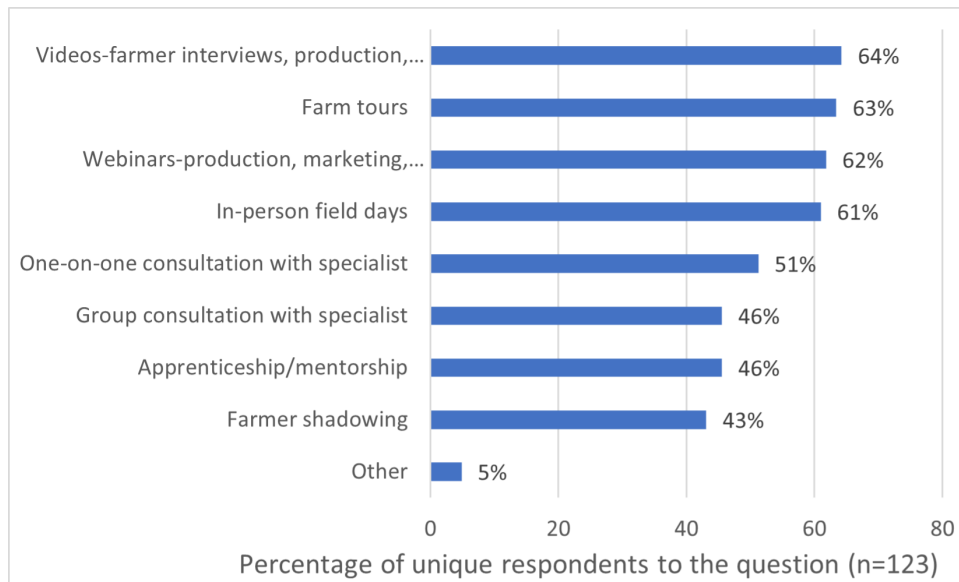


Figure 19. Preferred approaches to educational opportunities (n=542).

## Qualitative Results

Comments from the focus group and solicited feedback from the seminar were collected and coded using a thematic coding process (Vaughn & Turner, 2015). A total of 39 additional comments were made outside of the survey. These comments were categorized into sixteen common themes (Table 1). These themes reflect similar ones identified in the survey results.

The widespread survey responses indicate that there is a definite presence of urban, beginner, and small-scale farmers in Arizona who are interested in Extension programming. The farmers we reached with this survey are similarly split between rural and urban areas, predominantly farm on a small amount of land (less than four acres) and earn less than \$250,000 gross revenue.

Table 1. Themes from the focus group dialogue and solicited feedback from the seminar.

Category	n	%
Loans, grants, and financial assistance	9	23.0
Networking opportunities	4	10.2
Infrastructural guidance	3	7.7
Accessibility to Extension educators	3	7.7
Beekeeping	3	7.7
Agricultural apprenticeship	2	5.1
Medicinal herbs	2	5.1
Zoning and policy	2	5.1
Climate change and desert growing	2	5.1
Agri-tourism	2	5.1
Microgreen production	2	5.1
On-farm data collection	1	2.6
Hydro and aquaponics	1	2.6
Water conservation	1	2.6
Organic production	1	2.6
Land access	1	2.6
Total	3	9

Through the survey, these farmers expressed the desire for Extension assistance, as they face many barriers and educational gaps that Extension can help bridge.

As the interest in urban agriculture continues to grow and attract beginner farmers, Extension will be able to provide educational programming to help farmers develop the skills required for a successful operation. Extension programming in Arizona should address the top barriers identified, including drought, product distribution, processing and storage facilities, finding and entering profitable markets, and access to credit and financing. It should also address the topics of interest identified, including soil management, composting and fertilization, farm financial management, high-tunnel and greenhouse management, recordkeeping, irrigation, and marketing and advertising. Extension should also address organic principles as many participants indicated using organic

practices on their farm. This trend is reflected throughout the country as organic farming continues to increase in popularity: between 2016 and 2019, there was a 17% increase in the number of organic farms in U.S. (Matlock, 2021).

Most participants indicated they would like a combined approach to educational opportunities, including in-person, in-the-field, synchronous webinars, and asynchronous videos and recordings. This will help Extension format future workshops, seminars, and educational events. For example, the most requested topics should be covered in multiple formats for maximal accessibility, while less requested topics could be covered in videos or less resource-intensive formats.

In addition to educational programming, Extension can focus efforts on agricultural research applicable to small-scale farms. Extension has historically focused on

larger-scale, rural farming and ranching, so research and resources specific to smaller-scale, urban farming is less available. For example, publications could focus on science relevant to the needs identified by these farmers, including soil conservation and water management on small, urban farms as well as policy and regulations such as land access, city zoning, municipal water sources, and limitations on urban livestock. These problems are not unique to Arizona, as urban and small-scale farmers face similar challenges across the country (Oberholtzer et al., 2014).

Finally, additional needs assessment should be conducted with indigenous growers. This demographic represents a large portion of Arizona's agricultural producers. Efforts to reach, include, and create accessible material for these communities needs to be a priority for Extension's urban, small-scale, and beginner farmer agricultural initiatives moving forward. An immediate next step will be partnering with Tribal Extension to distribute surveys tailored to priorities of indigenous growers.

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# Appendix

## Urban Ag/Small-scale/Beginner Farmer Needs Assessment Survey

1. Is your current or planned farming operation located within: (select all that apply)
  - a. A tribal reservation
  - b. A metropolitan or urban area
  - c. A rural area
2. How many years have you been involved in agriculture of any type (including full-season farm experience, ownership, internships, apprenticeships, etc.)?
  - a. No experience
  - b. Less than 1 year
  - c. 1-5 years
  - d. 6-10 years
  - e. 10+ years
3. How many years of experience do you have working in urban agriculture?

Urban agriculture includes the production, distribution, and/or marketing of agricultural products within a metropolitan area. Urban farming can also include community and school gardens, backyard and rooftop production, and production in vacant lots or parks.

  - a. No experience
  - b. Less than 1 year
  - c. 1-5 years
  - d. 6-10 years
  - e. 10+ years
4. How many acres is your garden/farm/ranch?
  - a. Less than 1 acre
  - b. 1-4 acres
  - c. 5-9 acres
  - d. 10-19
  - e. 20+ acres
  - f. N/A
5. Do you farm full-time or part-time?
  - a. Full-time
  - b. Part-time
  - c. Plan to farm in the next 1-3 years
  - d. Plan to farm in the next 4-10 years
6. What type of market are you primarily interested in (check all that apply)?
  - a. Community supported agriculture (CSA)
  - b. Farmer's market
  - c. Wholesale
  - d. Restaurants
  - e. Homestead capacity (i.e., agricultural products for personal and family use)
  - f. On-farm sales
  - g. Food hub/cooperative (centrally located facility where farmers and community members can help organize and sell their produce)

h. Other

7. What farm operation do you have/plan to have (check all that apply)?

- a. Vegetable
- b. Fruit and nut
- c. Poultry
- d. Livestock
- e. Cut flowers
- f. Beekeeping
- g. Aquaponics/hydroponics
- h. Mushrooms
- i. Grain crops
- j. Other

8. What production methods do you use/plan to use (check all that apply)?

- a. Raised-beds
- b. Containers
- c. In-ground
- d. Green house
- e. High tunnel
- f. Hydroponics/aquaponics
- g. Artificial or supplemental lights
- h. Other

	Not a barrier at all	Slight barrier	Moderate barrier	Extreme barrier
Access to credit and financing				
Accessibility of land or buildings to rent or purchase				
Labor				
Finding and entering profitable markets				
Crop production information				
Livestock production information				
Water access				
Language				
Technology				
Transportation and equipment				
Business planning and marketing skills				
Education and training				
Drought				
Processing and storage facilities				
Product distribution				

9. Which of the following best fits your current/planned farm operation?
  - a. Certified organic
  - b. Transitioning to certified organic
  - c. Not certified organic, but following organic principles (products produced without using most conventional fertilizers, pesticides, and herbicides)
  - d. Conventional (i.e., use of synthetic inputs like chemical fertilizers, pesticides, and herbicides)
  - e. Biodynamic (products produced with natural processes, biodiversity, and cycles adapted to local conditions)
  - f. Other
10. What are your operations' gross revenue?
  - a. N/A
  - b. Less than \$5,000
  - c. \$5,000-\$9,999
  - d. \$10,000-\$24,999
  - e. \$25,000-\$49,999
  - f. \$50,000-\$99,999
  - g. \$100,000-\$249,999
  - h. \$250,000-\$499,999
  - i. \$500,000-\$999,999
  - j. \$1 million or more
11. Which of the following apply to the goals of your current/planned operation (check all that apply)?
  - a. Produce healthy food for yourself and family
  - b. Produce healthy food for the community
  - c. To earn a living
  - d. To create jobs for my community
  - e. To provide supplemental income
  - f. Empower and educate my community
  - g. Beautify the community
  - h. Other
12. Identify barriers for your current/planned
13. Pick 5 subjects you would like to learn more about:
  - a. High-tunnel and greenhouse management
  - b. Recordkeeping
  - c. Farm financial management
  - d. Sustainable pest management/IPM
  - e. Composting and fertilization
  - f. Organic production
  - g. Food safety
  - h. Urban agri-tourism
  - i. Irrigation
  - j. Cover cropping practices
  - k. Soil management
  - l. Crop rotation practices
  - m. Livestock production

- n. Marketing/Advertising
  - o. Farming in drought conditions
  - p. Post-harvest processing and storage
  - q. Product distribution and transportation
  - r. Accepting SNAP and other benefits
  - s. Other
14. Which of the following opportunities are you interested in (check all that apply)?
- a. One-on-one consultation with specialist
  - b. Group consultation with specialist
  - c. Videos- farmer interviews, production techniques, etc.
  - d. In-person field days
  - e. Farm Tours
  - f. Webinars- production, marketing, techniques, etc.
  - g. Farmer shadowing
  - h. Apprenticeship/Mentorship
  - i. Other
15. Would you prefer in-person, online (zoom), or a combined approach to live educational events?
- a. In-person
  - b. Online
  - c. Combination
  - d. I am not interested in live educational events
16. Which of the following best describes the times you can participate in educational opportunities? (Check all that apply)
- a. One-day weekday workshops
  - b. One-day weekend workshops
  - c. One-day evening workshops
  - d. Multi-session weekday workshops
  - e. Multi-session evening workshops
  - f. Multi-session weekend workshops
  - g. Other
17. How familiar are you with University of Arizona cooperative Extension?
- a. Have not heard of it
  - b. Heard of it, but don't know anything more
  - c. Heard of it and know a little about it
  - d. Know a lot about it
  - e. Participated in a Cooperative Extension program or event
  - f. Partnered/worked with Cooperative Extension
18. How did you receive this survey?
- a. Farm Bureau
  - b. Pinnacle Prevention
  - c. International Rescue Committee (IRC)
  - d. Arizona Health Zone
  - e. Beginning Farmer Listserv
  - f. UA Extension
  - g. Other
19. How do you prefer to receive information (check all that apply)?



- a. Email
- b. Newsletter
- c. Blog
- d. Social media
- e. Text
- f. Other (write in)

20. How would you describe yourself?

- a. Native American or Alaska Native
- b. Hispanic, Latino, or Spanish
- c. Asian or Asian American (e.g., Chinese, Vietnamese, Indian, or Nepali)
- d. Black, African, or African American
- e. Native Hawaiian or Other Pacific Islander
- f. Middle Eastern or North African
- g. White
- h. I identify another way

21. What gender do you identify as?

- a. Male
- b. Female
- c. Non-binary/third gender
- d. Prefer not to say

22. Any final comments regarding resources or opportunities that would be helpful to your farm/operation/business?

23. Selecting yes on either of the following questions will direct you to a contact information section. This optional information will not be connected with your survey responses (which will remain anonymous) and will be stored securely.

Would you like to receive future urban agriculture and beginning farmer information from UArizona Extension?

- a. Yes
- b. No

24. Would you like to be entered into the drawing to receive a thermal 20oz tumbler?

- a. Yes
- b. No

25. Please enter your contact information below. All fields are optional, and you may close out of this survey if you do not wish to enter your information. Your contact information will not be connected with your previous survey responses and will be stored securely.

Name (first last)

Phone number

Email address

Address

Address line 2

City

Zip Code



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