

WORK
BOOK



URBAN FARMING

An introduction to urban farming, from types and benefits to strategies and regulations.

INTRODUCTION

For nearly sixty years, the poet, environmentalist and farmer Wendell Berry has been championing agriculture that is local, culturally and contextually relevant, and that fosters a deep connection between people, community, food and the land. Berry famously declared that “eating is an agricultural act,” implying that whether we realize it or not, we all actively participate *in* agriculture.¹ Given the great disconnect that arose between farming and most people with the industrialization of agriculture in the 1950s and 1960s, it is probably safe to say that many of us did not realize we were participants in agriculture.

However, with the recent resurgence of farming in and around cities, people have been reconnecting to agriculture by growing food themselves, visiting farmer’s markets, participating in community supported agriculture programs or any number of other urban farming activities. Throughout the country, urban farming is establishing itself as an integral part of local and regional food systems. In the Phoenix metropolitan area, urban farming has taken root, increasing access to healthy food and providing social and economic opportunities for countless residents.

Urban Farming, the third publication in the WorkBook Series, introduces readers to the many aspects of urban farming, from types and benefits to strategies and regulations. As the popularity of farming in cities has grown, there has been a proliferation of publications covering every aspect of urban agriculture.* To help readers navigate this wealth of information, this workbook provides a synthesis of key topics and includes an extensive resource guide for further reading.

* Following accepted usage, the terms ‘urban farming’ and ‘urban agriculture’ will be used interchangeably throughout the WorkBook.

1 W. Berry, *The pleasures of eating*. Center for Ecoliteracy, www.ecoliteracy.org/article/wendell-berry-pleasures-eating



“WHATEVER LOFTY THINGS
YOU MIGHT ACCOMPLISH
TODAY, YOU WILL DO THEM
ONLY BECAUSE YOU FIRST
ATE SOMETHING THAT
GREW OUT OF DIRT.”

BARBARA KINGSOLVER

DARREN CHAPMAN
AT GARDEN OF
TOMORROW IN
SOUTH PHOENIX.
PHOTO BY PETER HADEN:
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PHOTO CREDIT COVER: GRADING THE SITE AT MESA URBAN GARDEN BY DAVID CRUMMEY: FLICKR CC

WHAT IS URBAN AGRICULTURE?

In the United States and Canada, urban agriculture typically refers to the “growing, processing and distribution of food crops and animal products – by and for the local community – within an urban environment.”² Examples of urban agriculture abound, existing in many forms including: community and backyard gardens; rooftop and balcony gardening; growing in vacant lots, right-of-ways, and parks; aquaculture; hydroponics; fruit trees and orchards; market farms; raising livestock and beekeeping. Urban agriculture also involves post-harvest activities such as creating value-added products in community kitchens, farmers’ markets and road-side farm stands, marketing crops and products, and addressing food waste. Importantly, urban agriculture is context specific, meaning that its forms and practices vary according to the conditions of the local environment – social, cultural, economic, physical and political.

“HOW WE EAT DETERMINES,
TO A CONSIDERABLE EXTENT,
HOW THE WORLD IS USED.”

WENDELL BERRY

National and international surveys of urban farming practices reveal an expansive set of practices created by neighborhoods, communities and cities to meet the needs and desires of their constituents. Consequently, not only does urban agricultural differ between cities, but the policies, programs and infrastructure that support it and ensure its long-term viability, vary widely as well. As a result, urban agriculture is both a bottom-up and a top-down endeavor: it requires action, organizing and commitment from individuals and community groups and it requires municipal backing through supportive policies, appropriate zoning, and financial backing and incentives.

² University of Missouri Extension, www.extension.missouri.edu/foodsystems/urbanagriculture.aspx

PHOTO BY
STEPH ECHEVESTE:
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MAYA'S FARM IN SOUTH PHOENIX. PHOTO BY MSWINE: FLICKR CC



CONVENTIONAL VERSUS ALTERNATIVE (INCLUDING URBAN) AGRICULTURE

CONVENTIONAL/INDUSTRIAL AGRICULTURE	ALTERNATIVE/SUSTAINABLE AGRICULTURE
National/international production, processing and marketing	More local/regional production, processing and marketing
Concentrated with fewer farmers	Dispersed with more farmers
Large, capital-intensive production	Smaller, low-capital production
Impersonal, consumerism	More personal, community self-sufficiency
Competition focused – farming as business only	Community focused – farming as rewarding, a way of life
Domination of nature	Harmony with nature
Production maintained by agricultural chemicals – synthetic fertilizers, pesticides, herbicides, fungicides	Production maintained by development of healthy soil, use of integrated pest management techniques
Specialization: monoculture crops with single-cropping in succession	Diversity: polycultures with multiple crops grown in complementary rotations
Separation of crops and livestock	Integration of crops and livestock
Standardized production systems	Locally adapted production systems
Exploitation: reliant on nonrenewable resources, focus on short-term benefits over long-term consequences, external costs often ignored	Restraint: consideration of all external costs, concern with short-term and long-term outcomes, focus on renewable resources and conservation of nonrenewable resources

Adapted from: Beus, C.E. and Dunlap, R.E. (1990) Conventional versus alternative agriculture: the paradigmatic roots of the debate. *Rural Sociology*, 55(4): 599.]



LEFT: FARM STAND AT AGRITOPIA. PHOTO BY AARON BURR: FLICKR CC

BELOW: LOCAL PRODUCE. PHOTO BY MATT: FLICKR CC



Urban agriculture makes up one aspect of a city's food system. Each of urban agriculture's components - production, processing, and distributing - and the associated activities, is linked to a variety of community benefits. The benefits vary according to the type of urban farming: personal consumption, institutional, educational, for-profit, nonprofit and so forth. Successful community-based urban farming projects require considerable planning and commitment that grows out of the interests of a particular neighborhood or community. Similar to any other effective endeavor, when residents identify the goals, ideals and, with urban farming, the aesthetics, the potential benefits escalates. Urban farming projects that reflect and evolve from a community's cultural values and future vision are much better positioned to have lasting impact and lead to more ecologically sustainable ways of providing food.³

3 Guthman, J. 2008, "If they only knew": color blindness and universalism in California alternative food institutions. p395

COMPONENTS OF A SUSTAINABLE COMMUNITY FOOD SYSTEM



FRUIT TREES AND CHICKENS IN PHOENIX.
PHOTO BY JEREME RAUCKMAN: FLICKR CC

Source: Adapted from University of California, Davis Agricultural Sustainability Institute, Defining Sustainable Community Food Systems, <http://asi.ucdavis.edu/programs/sarep/research-initiatives/fs/sfs/defining-sustainable-community-food-systems>

BENEFITS OF URBAN AGRICULTURE

Urban agriculture can support the well-being of individuals and communities in multiple ways: developing local food systems, contributing to food security, promoting economic development, strengthening social integration and improving urban biodiversity and environmental health.

Social and Cultural Benefits

Urban agriculture can be an “agent of change” for communities by providing opportunities for strengthening social bonds, expressing and maintaining cultural heritage, and engaging in activities promoting social and political change.⁴ Importantly, urban agriculture is seen by many as integral to practicing food justice. Projects that evolve out of the neighborhoods and communities in which they are located and are led by residents often enjoy the greatest level of participation and commitment and, by extension, confer the most benefit. Working together on urban agricultural projects, people get involved in building their communities through organizing, advocacy and collective action. By transforming vacant or

underutilized properties into productive landscapes that provide places to gather and share knowledge about food, residents not only enhance the beauty of their neighborhood through greening, they expand their cultural competencies by learning from others.

⁴ L. Holland, “Diversity and connections in community gardens.” *Local Environment*, 2004, 9(3), p 291; N. Cohen, K. Reynolds and R. Sanghvi, *Five Borough Farm: Seeding the Future of Urban Agriculture in New York City*, Design Trust for Public Space, Design Trust for Public Space, 2012, p45 Guthman, J. 2008, “If they only knew”: color blindness and universalism in California alternative food institutions. p395.



MAP: MASSACHUSETTS AVENUE PROJECT (WWW.MASS-AVE.ORG) IN BUFFALO, NY, FIVE VACANT LOTS TRANSFORMED BY URBAN FARMING. PHOTOS BY MARK HOGAN: FLICKR CC

COOKOUT AFTER
COMMUNITY WORK
DAY AT GARDEN
OF TOMORROW IN
SOUTH PHOENIX.
PHOTO BY THOMAS
FISCHER



Urban agricultural activities also provide opportunities for people of all ages to interact, leading to growth of intergenerational bonds. These opportunities for social interaction are especially important for people who are isolated or from typically segregated groups such as older people, disabled people, women, people of color, people of different faiths or different educational backgrounds, and people from different socioeconomic classes.⁵ The act of getting together for a common purpose fosters a sense of belonging, increases community cohesion, improves quality of life and, importantly, spawns a new generation of engaged citizens.⁶

Health, Nutrition and Food Accessibility Benefits

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.⁷ People without consistent, daily access to food are determined to be “food insecure”. Across the country over 48 million people or 15.4 percent of the population are food insecure. In Arizona, that rate jumps to 17.1 percent or nearly 1.2 million people.⁸ Arizona’s children are more likely to be food insecure than adults or seniors.

Food insecurity means more than missing a meal here and there, it has long lasting effects on the health of people in our communities. Urban farming can be part of the solution for increasing food security among urban residents. However, its

“FOOD JUSTICE IS THE RIGHT OF COMMUNITIES EVERYWHERE TO PRODUCE, PROCESS, DISTRIBUTE, ACCESS AND EAT GOOD FOOD REGARDLESS OF RACE, CLASS, GENDER, ETHNICITY, CITIZENSHIP, ABILITY, RELIGION, OR COMMUNITY. FOOD JUSTICE ENSURES: FREEDOM FROM EXPLOITATION; THE RIGHTS OF WORKERS TO FAIR LABOR PRACTICES; RESPECT, EMPATHY AND PLURALISM; RACIAL JUSTICE THROUGH THE DISMANTLING OF RACISM AND WHITE PRIVILEGE; AND GENDER EQUITY”

INSTITUTE FOR AGRICULTURE
& TRADE POLICY

5 R. Santo, A. Palmer and B. Kim, *Vacant Lots to Vibrant Plots*, Center for a Livable Future, Johns Hopkins University, 2016, p4.

6 S. Golden, “Urban agriculture impacts: social, health and economic.” Agricultural Sustainability Institute, UC Davis, 2013, p10.

7 FAO, 1996. *Rome Declaration on World Food Security and World Food Summit Plan of Action*. World Food Summit, 13-17 November. Rome.

8 Feeding America, <http://map.feedingamerica.org/county/2014/overall/arizona>

“PEOPLE WITH NO SUPERMARKETS WITHIN A MILE OF THEIR HOMES ARE 25 TO 46 PERCENT LESS LIKELY TO HAVE A HEALTHY DIET THAN THOSE WITH MORE NEARBY SUPERMARKETS.”

POLICYLINK

impact is contingent upon several factors, such as the amount of urban land available for farming, the existence of policies and institutions that support and promote urban farming, the cost of the food produced and resident interest in participating in growing food and making it available to populations that are vulnerable to food insecurity.

In addition to its potential for improving food security among urban residents, urban farming has been linked to a range of health benefits. Providing affordable access to fresh produce, especially in neighborhoods with few grocery stores or supermarkets, not only may foster interest in trying new foods, it may help reduce consumption of processed foods.

When the types of crops grown on local farms reflect the preferences of local consumers, consumption of culturally appropriate food increases, which may lead to greater consumption of healthy, fresh food. In turn, maintaining a healthier diet may help reduce incidences of diabetes and obesity among urban residents. Additionally, produce grown on urban farms reaches consumers more quickly and with less handling, cutting the amount of nutrient deterioration and damage that can occur with food shipped in from elsewhere.⁹

9 “Local and Urban Agriculture,” www.chgeharvard.org/topic/local-and-urban-agriculture

OAKLAND FRESH SCHOOL PRODUCE MARKETS

Oakland Unified School District’s farm-to-school program created Oakland Fresh School Produce Markets to increase access to fresh, affordable, healthy food for students and families. By purchasing produce from local farmers, Oakland Fresh supports the local food system as well. Additional features of the program include “monthly cooking demonstrations and tastings, a Student Buyer Card program, and a Market-to-Classroom Lesson Toolkit for teachers.”

Visit www.ousd.org/Page/946 for more information.



PHOTOS BY HEACPHOTOS: FLICKR CC



Urban farms utilizing pest management strategies that exclude dangerous pesticides and herbicides protect farm workers and consumers from possible toxic effects of these chemicals and keeps chemicals and excess nutrients out of the water supply. Beyond the nutritional benefits, urban farming provides opportunities for physical exercise and increased well-being. Research links participating in urban agricultural activities with a variety of therapeutic benefits including stress reduction, cognitive stimulation, spending time outdoors connecting with nature, and creating a sense of accomplishment.¹⁰

Education, Skill Building and Job Training Benefits

Urban agriculture projects can include programs targeted at building skills and providing job training for young people and those looking for new opportunities. Working in urban agriculture requires a multitude of skills in areas such as leadership, fundraising, marketing, project management and customer service, all of which can be acquired through formal programs or routine, daily participation. Urban agriculture also offers opportunities to gain knowledge and expertise in aspects of the food system, including agriculture methods, sustainability and environmental stewardship, horticulture and animal husbandry, food provenance, and nutrition.¹¹



TOP: KIDS PLANTING TRADITIONAL FOODS.
PHOTO BY GRAND CANYON NATIONAL PARK:
FLICKR CC

ABOVE BOTTOM: GARDENING AT THE
GARDEN OF TOMORROW IN SOUTH PHOENIX.
PHOTO BY PETER HADEN: FLICKR CC

¹⁰ R. Santo, A. Palmer and B. Kim, *Vacant Lots to Vibrant Plots*, Johns Hopkins Center for a Livable Future, 2016, p13.

¹¹ *Ibid.*, p6.

RIGHT: MILWAUKEE'S GROWING POWER YOUTH AND ADULT TRAINING PROGRAM. PHOTO BY RYAN GRIFFIS: FLICKR CC

BELOW: YOUTH INTERNSHIP PROGRAM PARTICIPANT. PHOTO BY USDA-EAST NEW YORK FARMS: FLICKR CC



Often urban agriculture projects with a social mission offer internships – paid when possible – for youth to create viable, interesting and constructive activities that promote responsibility and engagement. Similar programs geared to other groups, such as the formerly incarcerated or long-term unemployed, also are impactful. Depending on the community and farm location, skills also may include learning how to use public transit for those people without cars and gaining increased English proficiency for non-English speaking individuals.



“ IT TAKES A LOT OF SKILL TO BE ABLE TO GROW FOOD SUSTAINABLY. IT’S AN ART FORM. WE NEED TO RAISE AGRICULTURE UP TO ANOTHER DIFFERENT LEVEL LIKE THEY DO IN EUROPE WHERE FARMERS ARE ON THE SAME LEVEL AS ENGINEERS AND DOCTORS... BECAUSE THE FOOD THAT WE EAT IS THE MOST IMPORTANT THING IN OUR LIVES.”

WILL ALLEN, GROWING POWER, MILWAUKEE

Economic Benefits

As a community enterprise, urban agriculture often is supported based on its potential to stimulate a local economy through job creation, income generation, and the growth of small businesses. In economically depressed communities, the entrepreneurial potential of urban agriculture may lead to the creation of profitable businesses by residents. In addition to the farms themselves, farmers' markets, mobile farm trucks, consumer supported agriculture (CSA) enterprises, and the creation of value-added products exemplify business opportunities associated with urban agriculture. Additionally, businesses that support urban agriculture activities during the cultivation, processing and distribution stages also benefit and may be created just to support a thriving urban farming scene. Supporting local food enterprise incubators, food hubs, producer marketing cooperatives, and other initiatives contributes to a dynamic environment open for economic innovation.

Urban agriculture also can be linked to making fresh food more affordable. For people participating in community farms or farming cooperatives, the food they grow replaces food they would have purchased, saving money. Furthermore, community farms often grow for or donate their surplus produce to food banks. The increased availability of produce

at food banks helps reduce monthly food bills for low-income people and families.

The economic benefits of urban agriculture extend beyond farming activities. When urban farms locate on vacant public land, vandalism and illegal dumping decreases saving cities money on maintenance costs. Urban farming also is linked with increased property values, generating increased tax revenues. The downside of higher property values is the risk of displacing long-time residents and its negative consequences.

Environmental Benefits

From supporting biodiversity, reducing stormwater runoff, improving air quality and mitigating urban heat island effects to reducing, or, in the case of organic farming, eliminating pesticide, herbicide and synthetic fertilizer use, urban agriculture affords a variety of environmental benefits. The extent of these benefits depends on what type of urban agriculture is practiced and how it is managed.

In many cities, urban farming supports biodiversity by providing crucial habitat for pollinators such as bees, bats, butterflies and birds and offers opportunities for culturally significant, heirloom and wild crops to be re-introduced.¹²

¹² For more information on the relationship between urban farming and urban biodiversity, see G. Galluzzi, P. Eyzaguirre and V. Negri, "Home gardens: neglected hotspots of agro-biodiversity and cultural diversity," *Biodiversity and Conservation*, 2010, 19: 3635-3654; M.A. Goddard, A.J. Dougill and T.G. Benton, "Scaling up from gardens: biodiversity conservation in urban environments," *Trends in Ecology and Evolution*, 2009, 25(2): 90-98; B.B. Lin, S.M. Philpott and S. Jha, "The future of urban agriculture and biodiversity-ecosystem services: challenges and next steps," *Basic and Applied Ecology*, 2015, 16: 189-201; and S. Mann, S. Jose and M. Gold, "Urban agroforestry: connecting agroecology, permaculture, urban forestry and urban agriculture into urban food." *Urban agroforestry: connecting agroecology, permaculture, urban forestry and urban agriculture into urban food*. "Urban agroforestry: connecting agroecology, permaculture, urban forestry and urban agriculture into urban food." Center for Agroforestry at the University of Missouri, 2015, available at www.extension.iastate.edu/forestry/tri_state/2015%20agro/Talks/Mann_Urban%20Forestry.pdf



LEFT TO RIGHT: SOL FOOD MOBILE FARMS. PHOTO BY SUZIE TREMMEL; FLICKR CC; MOBILE FARM MARKET. PHOTO BY UGA; FLICKR CC; VALUE-ADDED PRODUCTS. PHOTO BY DWIGHT SIPLER; FLICKR CC

Through seed sharing and banking, these specialty crops are preserved for future generations. To control pests without the use of pesticides and herbicides on crops, farmers can utilize integrated pest management thereby decreasing risks associated with agricultural chemicals.

In addition, urban agriculture projects can be used to mitigate brownfields, turning derelict properties into community greenspaces. Urban farming also may reduce energy use and carbon emissions by growing food where it is consumed, significantly cutting transportation-related greenhouse gas emissions.

In Phoenix, urban agriculture can also help temper extreme summer temperatures and urban heat island effects by replacing paved and dirt surfaces with vegetation, including trees, and in so doing, ease cooling demands.¹³ This is especially important for low-income neighborhoods which tend to have less tree cover and ground vegetation and, consequently, higher summertime temperatures.¹⁴

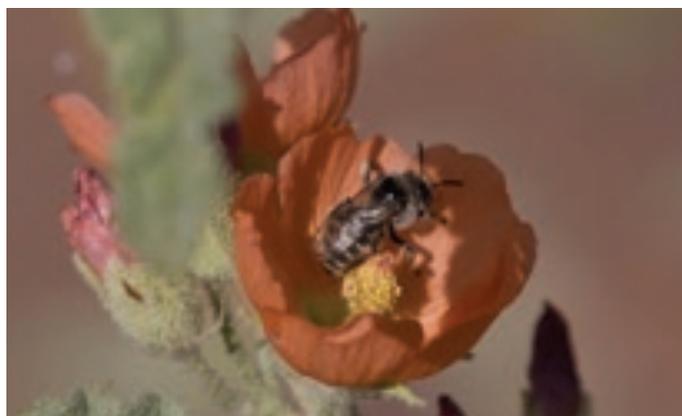
¹³ A. Middel and N. Chhetri, *City of Phoenix Cool Urban Spaces Project: Urban Forestry and Cool Roofs*. Center for Integrated Solutions to Climate Challenges, Arizona State University.

¹⁴ G.D. Jenerette, S.L. Harlan, W.L. Stefanov and C.A. Martin, "Ecosystem services and urban heat riskscape moderation: water, green spaces, and social inequality in Phoenix, USA." *Ecological Applications*, 2011, 21(7).

ARIZONA POLLINATORS

Pollinators such as bees, birds, bats and butterflies are essential to urban farms and community gardens, and attracting them to urban areas requires planting flowering plants where possible, including on farm and garden land. In recognition of the importance of pollinators, Governor Ducey issued a proclamation for Arizona Pollinator Week in June 2016.

To learn more about what to plant to attract pollinators, visit www.pollinator.org and look for the Arizona-New Mexico Regional Guide under the "Planting Guides" tab. The Arizona Department of Agriculture and the University of Arizona also are excellent resources (www.agriculture.az.gov/sites/default/files/AZ%20MP3%20Jan%2016.pdf; <https://uanews.arizona.edu/story/protection-pollinator-world-important-agriculture>).



ARIZONA POLLINATORS. PHOTOS BY ANNE REEVES: FLICKR CC

POTENTIAL BENEFITS OF URBAN AGRICULTURE

WHAT IS INTEGRATED PEST MANAGEMENT?

Integrated Pest Management, or IPM, is a process for controlling pest problems while minimizing risks to people and the environment. With IPM, you take actions to keep pests from becoming a problem. Rather than simply eliminating the pests you see right now, using IPM means you'll look at environmental factors that affect the pest and its ability to thrive. With this information, you can create conditions that are unfavorable for the pest.

- Biological controls: using natural enemies of identified pests
- Cultural controls: using practices to reduce the presence, reproduction and survival of pests (e.g., irrigation techniques)
- Mechanical and physical controls: using techniques such as trapping, mulches and barriers
- Chemical controls: using pesticides only when absolutely needed and in conjunction with other methods

SOURCE: UNIVERSITY OF CALIFORNIA AGRICULTURE & NATURAL RESOURCES, WWW2.IPM.UCANR.EDU/WHATISIPM

SOCIAL + CULTURAL

- Community gathering spaces
- Builds social capital
- Express and maintain cultural heritage
- Provides an educational venue
- Opportunities for community activism
- Food justice

HEALTH BENEFITS

- Access to fresh, affordable food
- Access to culturally important foods
- Improve community food security
- Greater variety of foods
- Opportunity for physical exercise
- Improved psychological well-being
- Improved knowledge of cooking techniques and food preparation

ECONOMIC

- Generate revenue
- Employment opportunities
- Entrepreneurial opportunities
- Reduce municipal maintenance expenses
- Increased affordability of food
- Household savings
- Higher property values

ENVIRONMENTAL

- Reconnects community members with natural environment
- Increases urban green spaces
- Mitigates urban heat island
- May improve air quality
- Increased urban biodiversity
- Increases stormwater capture and infiltration, and reduces runoff
- Reduces food waste through composting
- Decreases agrochemical use
- Reduces carbon footprint

OVERVIEW OF URBAN AGRICULTURE

Urban agriculture encompasses a wide array of food-producing projects and activities and is found on sites of all scales, both indoors and out. Broadly speaking, urban agriculture projects fall into one of four general categories: community-based; institutional; public; and commercial. Occasionally, projects may fit into more than one category as happens when an urban farm has both a for-profit commercial operation and a nonprofit community aspect that has a social mission. The following is a brief overview of these different categories of urban agriculture.



PHOTO BY
JANELLE ORSI:
FLICKR CC

Community-based Urban Agriculture

Community-based urban agriculture ranges from small-scale residential projects and volunteer-run community gardens to mission-based enterprises operated by non-profit organizations. The latter often use urban farming as a strategy for community development and delivering social and educational programs. Although community-based urban agriculture can be an opportunity-rich activity for residents, communities and cities, it is important to recognize, understand and respect the values and desires of any project's intended participants or recipients. Since its resurgence in the 1970s and 1980s, urban farming most frequently has been practiced by middle-income people in middle income areas. As a result, many of the values about urban agriculture reflect the beliefs and goals of these practitioners and their communities and not necessarily those of the communities many contemporary urban farming projects are moving into.¹⁵ Therefore, to enhance the success rate of community-based urban agriculture programs, people from different backgrounds, income levels, ethnicities and races and abilities need to be involved from the beginning. Residents not only need to define the urban agriculture projects proposed for their neighborhoods, they need to participate in the project's leadership and decision making from the outset.¹⁶ As with any community-based activity, the best results occur when community members identify the priorities and set the goals for the project and then work together and with community partners to achieve those goals. Without community buy-in, urban agriculture projects face substantial hurdles.

One value of community-based urban agriculture projects is that they sometimes provide leadership and job training

programs to assist people in gaining skills necessary to move into the workplace. Examples include programs that focus on a particular group (such as youth, recent immigrants or formerly incarcerated people) and develop educational and skill-building activities to meet their needs. Larger projects often are able to offer transitional employment as well.

NATIONAL EXAMPLES

RecoveryPark in Detroit leverages underutilized municipal assets to create jobs for people with barriers to employment. The nonprofit organization supports several businesses including RecoveryPark Farms, an urban farm that produces over 70 specialty items for local restaurants (www.recoverypark.org).

Windy City Harvest in Chicago offers several programs including the Windy City Harvest Youth Farm, the Windy City Harvest Corps and the Windy City Harvest Apprenticeship. The Youth Farm and Corps work with youth, including those involved in the justice system, providing training and transitional jobs. The Apprenticeship is a nine-month certificate program and a three-month paid internship delivered in partnership with the City Colleges of Chicago. Windy City Harvest is part of the Chicago Botanic Garden (www.chicagobotanic.org/urbanagriculture).

Growing Power, with locations in Milwaukee, Chicago and Madison, is a national leader in community-based urban agriculture. Through the Youth Corps programs, underserved youth participate in a year-round leadership program that provides job training and professional experience in Community Food System development and maintenance. Growing Power also has an internship program and an outreach training program available at cities across the country (www.growingpower.org).

15 J. Guthman, "Bringing good food to others: investigating the subjects of alternative food practice." *Cultural Geographies*, v15, 2008.

16 R. Santo et al, p8.

ARIZONA EXAMPLES

Tiger Mountain Foundation in Phoenix teaches life skills and financial literacy to youth, adults and seniors at community gardens in South Phoenix. As paid employees, participants build job skills and learn fundamentals of building a micro-business (www.tigermountainfoundation.org).

IRC's New Roots Farm Program in Phoenix provides immigrants of all backgrounds opportunities to build entrepreneurial and financial literacy skills. New Roots is an initiative of the International Rescue Committee (www.phxrenews.org).

Community Food Bank of Southern Arizona supports a variety of community-based programs, including: educational workshops; culinary skills and leadership training; a small farmer and backyard gardener cooperative; hunger relief program for food-insecure people in the community; a community garden and a community farm; a farm to child program in local schools; farmers' markets; a microloan program and many more. Located in Tucson, the Community Food Bank of Southern Arizona is an exemplary model of community-based urban agriculture (www.communityfoodbank.org).

Agave Farms is a community garden located on over 17 acres in central Phoenix (4300 N. Central Avenue). In addition to growing food for residents and local restaurants, Agave Farms hosts community events, offers lectures and workshops, donates food and provides volunteering opportunities for students from local schools (www.agave-farms.com).

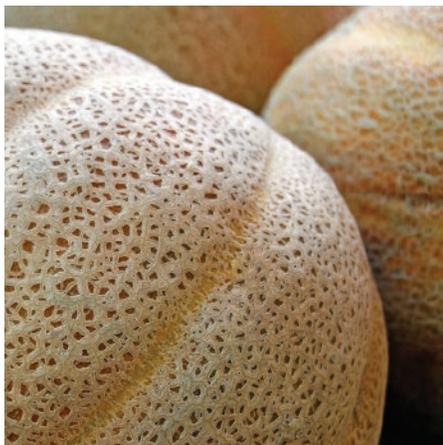


PHOTO BY ALICE HENNEMAN: FLICKR CC

TRAINING SESSION
AT MAYA'S FARM IN
SOUTH PHOENIX.
PHOTO BY
CHERYL COLAN:
FLICKR CC





PHOTO BY UGA:
FLICKR CC

Institution-based Urban Agriculture

Affiliated with schools, prisons, churches, community centers or hospitals, institution-based urban agriculture often has a social mission, similar to community-based projects. School farms and gardens provide opportunities for students to learn about the food system, nutrition, ecology and environmental sustainability. Farms and gardens at churches and community centers encourage social inclusion and community engagement among members and residents, and offer venues for education and expression of cultural food heritage. Farms located at prisons provide job readiness training, teamwork skills and horticulture education.

ARIZONA EXAMPLES

Orchard Community Learning Center (OCLC) offers STEAM (Science, Technology, Engineering, Agriculture, Arts, Math) educational programs for Roosevelt School District students. Programs at the South Phoenix campus are offered year-round, including a summer day camp (www.orchardlearningcenter.org/education-.html).

Tucson Village Farm (TVF) is an urban farm dedicated to youth education. Part of the University of Arizona and the Pima County Cooperative Extension, TVF offers programs for all age ranges and runs a Farm Camp every June (<https://tucsonvillagefarm.arizona.edu>).

Western Growers Association Collective School Garden Network – Arizona Gardens for Learning: Available at www.csgn.org. With a mission to locate a garden in every school in Arizona and California, the foundation supports schools with resources for starting a garden, information on funding and grants, and an online forum for educators and other stakeholders to connect with one another.

Public Urban Agriculture

As interest in cultivating local food systems grows across the country, many cities recognize the role public lands can play as sites for urban agriculture. Parks, street medians and planting strips, parking lots, utility rights-of-way, vacant or underutilized lots, grounds around municipal buildings (police and fire stations, libraries, courthouses, city hall) and public agencies all could support varying levels of urban agriculture. In response, some municipalities are developing policies to accommodate and encourage the use of these sites. Whether a city creates a city-run urban agriculture program (for example, Seattle, New York City, Portland) or simply changes the zoning ordinance and establishes a leasing program (for example, Milwaukee, Baltimore, Chicago), public lands are a key resource, especially given the scarcity of affordable land within most urban areas. To identify sites suitable for agricultural activities, cities and/or community organizations sometimes conduct inventories of public land as well as vacant or underutilized land. These inventories indicate properties available for use – temporary, long-term or permanent.

In addition to addressing issues of land access and zoning regulations, providing financial and institutional support for public urban agriculture projects is important. Existing funding strategies include using public sources and offering competitive grants and tax incentives as well as assisting with fundraising efforts. Some cities in the U.S. provide technical assistance to organizations and community members to

ensure successful projects. This may include access to city staff from various departments such as planning, utilities, neighborhood services, and parks and recreation.

NATIONAL & INTERNATIONAL EXAMPLES

The **City of Seattle's** Food Action Plan outlines the city's food system priorities, including the use of city-owned land for food production. The Plan includes information on how it was developed, tracking metrics and evaluation criteria. Details are available through the Office of Sustainability and Environment (www.seattle.gov/environment/food).

George Washington Carver Edible Park in Asheville, NC, contains 40 varieties of fruit and nut trees available for harvesting by city residents and visitors. Since 2002, the park has been a community resource, owned by the City of Asheville and managed by the city in collaboration with two nonprofit organizations, Bountiful Cities and the Buncombe Fruit and Nut Club (www.bountifulcities.org/gardens/ediblepark).

The **City of Calgary Community Orchards** program began in 2009 as “part of a community orchard research project in order to increase opportunities for local food production activities.” The City plants both trees and shrubs, and currently supports and maintains four community orchards. More information is available on the City's website: www.calgary.ca/CSPS/Parks/Pages/Programs/Community-orchards.aspx.

“ IF PUBLIC OFFICIALS WANT A HEALTHIER, MORE PROSPEROUS CITIZENRY, AND BELIEVE THAT ACCESS TO FRESH, LOCALLY SOURCED, WHOLESOME AND AFFORDABLE FOOD IS GOOD FOR BOTH THE INDIVIDUAL CITIZEN AND THE COMMUNITY AT LARGE, THEN PUBLIC OFFICIALS CAN NO LONGER REMAIN IDLE. IN THE FACE OF RISING FOOD INSECURITY AND DECLINING PUBLIC HEALTH STEMMING FROM A POOR DIET, PUBLIC OFFICIALS NEED TO PURSUE VARIOUS METHODS OF PROVIDING BETTER FOOD CHOICES IN THEIR COMMUNITY.”

DARRIN NORDAHL, *PUBLIC PRODUCE*



LEFT: MICROGREENS.
PHOTO BY PLANT
CHICAGO: FLICKR CC

RIGHT: MOBILE
CONTROLLED
ENVIRONMENT
AGRICULTURE SYSTEM.
PHOTO BY AGRILIFE
TODAY: FLICKR CC



The **City of Sacramento** adopted an Urban Agriculture Incentive Zone Ordinance to promote urban agriculture by reducing regulations and providing tax incentives. The ordinance applies to both the production and sale of locally grown foods (www.cityofsacramento.org/Community-Development/Planning/Long-Range/Urban-Agriculture).

The **Chicago Park District's Community Gardens in the Parks** program "provides guidance, support and resources to dozens of community garden groups across the city. From helping maintain beautifully landscaped perennial beds to managing [individual] plots of vegetables, there are a wide range of opportunities available for those who wish to become involved in Chicago's vibrant gardening movement." Currently, there are 82 gardens of all types participating in the program. Information on the program, including how to start a new one, is available on the park district's website (www.chicagoparkdistrict.com/facilities/community-gardens).

Commercial Urban Agriculture

Increasingly, people are pursuing urban agriculture as a for-profit, commercial venture. Focusing on niche markets, higher-margin products, and specialized services, some urban agriculture enterprises are successfully negotiating the for-profit landscape. A notable example is **controlled environment agriculture (CEA)** or vertical farming. Located in warehouses or housed in shipping containers, vertical farming sidesteps the need for expensive urban land and instead utilizes vertically stacked growing trays in highly regulated environments. By growing high-margin, quick turnover products such as micro-greens and selling them

directly to restaurants and markets, these farms demonstrate that farming profitably in cities is possible. The **University of Arizona's Controlled Environment Agriculture Center** offers several courses open to the public covering different aspects of CEA (www.ceac.arizona.edu).

Other commercial farms supplement produce sales with fee-for-service programs such as educational programs and tours or create value-added goods that develop a following.

NATIONAL EXAMPLES

Garden Fresh Farms is a CEA enterprise located near Minneapolis that utilizes old warehouse buildings to grow produce and fish. Garden Fresh runs a food hub, a CSA and sells to area grocery stores. Founder Dave Rosen, provides consulting services to people interested in starting their own urban farms (www.gardenfreshfarms.com).

Brooklyn Grange Rooftop Farms, located in Brooklyn, NY, grows a variety of vegetables and microgreens, runs a CSA, markets several value-added products and rents out space for special events (www.brooklyngrangefarm.com).

ARIZONA EXAMPLE

Arizona Microgreens grows a variety of greens at the Brooks Community School greenhouse facility and sells them at local farmers' markets and to local restaurants (www.arizonamicrogreens.com).

URBAN AGRICULTURE: CHALLENGES AND CONSIDERATIONS

Although urban agriculture can be an opportunity-rich activity for residents, communities and cities, it is not without challenges. From gaining community buy-in to securing land and funding, establishing and maintaining a successful urban agriculture project takes hard work, determination and support at multiple levels. As with any endeavor, it is best to know potential obstacles up front and prepare strategies for addressing them at outset.

Often the largest hurdles facing most urban agriculture projects involve access to land and municipal land-use regulations. As urban land values rise, the availability of affordable land for urban farming decreases, leading farmers to search for low-cost or free land to farm.¹⁷ The option to farm on public land is part of the solution and more cities should incorporate this into their urban agriculture plan. Increasingly, brownfields are being converted into farms. However, growing food on contaminated land requires remediation or using methods that eliminate contact between produce

and the ground, both of which can be costly. In cities with a preponderance of vacant and/or underutilized land, such as Phoenix, transforming sites with agricultural potential into productive farms serves multiple functions: access to fresh food increases; neighborhoods are beautified; and, in cases where a farm replaces asphalt or some other hardscape, the urban heat island is reduced. However, long-term use of these properties is not guaranteed. As a result, given the substantial investment in both time and money necessary to establish a successful urban agriculture enterprise, vacant land tends to be used for temporary gardens. **PHX Renews**, a project of Keep Phoenix Beautiful, is working to transform vacant lots in Phoenix into community gardens, pocket parks and other neighborhood amenities (www.phxrenews.org).

¹⁷ G. Rosenberg and N. Ela, "Land Tenure for Urban Farming: Toward a Scaleable Model." A Project of the University of Wisconsin-Madison and the USDA. Available online at <http://www.urbanagland.com>.

PHOTO BY KIM STEELE





Land Trusts, Conservation Easements and Open Space Zoning Districts

Additional strategies for securing land for urban agriculture include establishing land trusts, conservation easements and open space zoning districts. Typically, land trusts are nonprofit, community-based organizations formed to preserve land for a variety of reasons and are being used effectively for urban agriculture projects. The **Oregon Sustainable Agriculture Land Trust** (OSALT) specifically preserves land, both urban and rural, for sustainable agriculture purposes (www.osalt.org). The **City of Baltimore** sells city-owned land for \$1 to land trusts that meet a set of criteria (www.baltimoregreenspace.org/downloads/CMOSguide_000.pdf). Conservation easements preserve private property according to specific conditions and have a history of being used to maintain agricultural lands, both rural and urban. The **Center for Urban Agriculture at Fairview Gardens** in Goleta, California, established a conservation easement to protect the 120-year-old farm from development (www.equitytrust.org/2014/03/fairview-gardens). Several cities have utilized open space zoning districts to encourage urban agriculture and protect that land from being converted into other uses. The zoning codes of the cities of **Cleveland** and **Boston** are good examples (<http://planning.city.cleveland.oh.us/zoning/pdf/AgricultureOpenSpaceSummary.pdf>; www.bostonredevelopmentauthority.org/getattachment/cf439d3c-76ed-42ea-89d0-eaf0917468c3).

In 2016, the **Farm at Agritopia in Gilbert**, was transferred into an “agrarian trust” – a “privately operating nonprofit foundation for urban agriculture” – ensuring that the land will remain

farmland into the future (www.agrariantrust.org/land_access/land-access-agritopia; www.thefarmatagritopia.com).

Although more and more cities across North America are adopting policies supporting local food systems, updating comprehensive plans and rewriting zoning codes to allow for agricultural uses more broadly, barriers still exist. In the **City of Phoenix**, the Community Garden Policy Guidelines (www.phoenix.gov/pddsite/Documents/PZ/pdd_pz_pdf_00348.pdf) outline rules governing the establishment of community gardens. However, guidelines for urban agriculture in general have yet to be adopted. Consequently, regulations regarding animal husbandry, commercial sales and other key aspects of urban agriculture practice vary depending on a site’s zoning, requiring a careful review of the zoning code before starting any new operation or expanding an existing one. The **City of Phoenix Municipal Code** is available online (www.codepublishing.com/AZ/Phoenix/frameless/index.pl). It is important to note that zoning codes vary from city to city.

In addition to community support, access to land, and land-use regulations, would-be urban farmers need to consider a range of other issues relevant to running an urban agriculture enterprise. These run the gamut from water access and cost to the need for specialized knowledge and skilled labor to how to secure start-up funding and financing for ongoing operating costs. The issues will vary depending on the type of enterprise, whether it is nonprofit or for-profit, and a variety of other factors that are covered in the following sections.

URBAN AGRICULTURE: PRODUCTION, PROCESSING AND DISTRIBUTING

Each component of urban agriculture – production, processing, distribution – involves a variety of strategies and activities dependent on the type, scale, mission and other factors specific to the operation. Some urban farms may sell what they produce directly to consumers through community supported agriculture (CSA) programs, roadside stands, restaurants, schools or farmers’ markets while others may sell through an intermediary such as a local food hub, produce broker or distributor. To better understand the many activities associated with urban agriculture, this section outlines aspects of production, processing and distribution.

Production: Strategies and Activities

Production refers to what is grown and how it is grown, whether it is plant-based or animal-based, for human consumption or not (e.g., fibers, animal feed). Production covers everything from farm design (e.g., intensive plots, raised beds, controlled environment) to managing pests and tracking output through data collection. While not exhaustive, the following overview introduces some of the most common production strategies and activities.

SOIL QUALITY

Developing and maintaining healthy soil can be challenging in urban settings but is essential for success. To protect against the presence of urban contaminants and ensure that your soil will provide the best growth media, research the site’s history. The types of contaminants you are likely to find depend on the history and use of the property. Soil near bus routes, busy roads or highways can have elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) and lead. Soil near older homes (built before 1978) can also contain lead-based paint. County Recorders’ offices maintain title histories, and Sanborn or fire insurance maps and city directories that identify previous property uses, are useful starting points.

Have the soil tested for possible contaminants, pH, organic content and soil nutrients. Since testing for multiple contaminants can become expensive, working with an environmental consultant may make sense. The consultant will help determine which tests are necessary and assist with interpreting the results. Select a laboratory licensed by the **Arizona Department of Health Services** (www.azdhs.gov) for any contaminant testing. **The University of Arizona’s** Cooperative Extension maintains a list of laboratories that conduct nutrient testing (www.extension.arizona.edu/pubs). If the site contains contaminants at a level requiring cleanup, contact the **Arizona Department of Environmental Quality** (ADEQ) for assistance (www.azdeq.gov).



PHOTO BY ALICE HENNEMAN: FLICKR CC

The Environmental Protection Agency (EPA) has information and resources related to urban soil quality and Brownfields (www.clu-in.org/ecotools/urbangardens.cfm; www.epa.gov/brownfields/brownfields-and-urban-agriculture-interim-guidelines-safe-gardening-practices). A good resource for developing quality soil is available from the Center for Agroecology & Sustainable Food Systems at the University of California Santa Cruz (http://casfs.ucsc.edu/about/publications/for_the_gardener.html).

ORGANIC FARMING

As defined by the **USDA**, “Organic is a labelling term that indicates that the food or other agricultural product has been produced through approved methods. These methods integrate cultural, biological, and mechanical processes that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, and genetic engineering may not be used” (www.ams.usda.gov/publications/content/what-organic). To receive the label, the farm must be certified by the USDA and submit to regular inspections. The process can be expensive and time consuming for a small farmer. As a result, many small farmers will utilize organic methods but forgo certification. The USDA offers training modules and other resources for farmers interested in certification: www.ams.usda.gov/services/organic-certification/is-it-an-option. The USDA also regulates the labels *Free-range*, *Natural* and *Grass-fed*.

INTENSIVE IN-GROUND

To make the most of small plots of land typical of urban farms, intensive farming methods maximize food production through different planting techniques. The Arizona Master Gardener Manual, produced by the University of Arizona’s Cooperative Extension, offers a good introduction to these and other methods discussed in this section (www.cals.arizona.edu/pubs/garden/mg/index.html).

Intercropping: planting fast growing and slow growing crops in the same row together allows for repeated harvesting of the fastest growing while helping minimize pest problems (www.sare.org/Learning-Center/Books/Crop-Rotation-on-Organic-Farms/Text-Version/Guidelines-for-Intercropping)

Intensive spacing: planting with little space between plants helps reduce weeds and water evaporation; it is important to watch for restricted airflow, which can lead to disease (www.smallfarms.cornell.edu/2017/05/02/14-intensive-techniques).

Small-Plot Intensive Farming (SPIN): intensive, relay planting on a small plot of land, usually under 1/2 acre (www.spinfarming.com)

Square-Foot Gardening: intensive planting in narrow raised beds (www.squarefootgardening.org; www.squarefootgardening.com)

SQUARE FOOT GARDENING. PHOTO BY MSWINE: FLICKR CC





TOP: RAISED BEDS. PHOTO BY UGA: FLICKR CC

ABOVE: HIGH TUNNEL. PHOTO BY USDA: FLICKR CC

RAISED BED AGRICULTURE

Raised beds are a cost-effective way to farm on sites with contaminated soil or heavily compacted soil since they raise the growing medium above the ground surface. Raised beds are relatively simple to construct and allow flexibility and greater access for people using wheelchairs. The Alabama Cooperative Extension System and Texas A&M Extension have easy to follow guidelines (www.aces.edu/pubs/docs/A/ANR-1345/ANR-1345.pdf; http://aggie-horticulture.tamu.edu/earthkind/files/2010/10/E-560_raised_bed_garden.pdf).

GREENHOUSES, HOOP HOUSES & HIGH TUNNELS

Used to extend the growing season, greenhouses, hoop houses and high tunnels also help improve plant and soil quality by allowing for greater control over the growing environment. **Hoop Houses & High Tunnels** are unheated greenhouses (www.sare.org/Learning-Center/Topic-Rooms/High-Tunnels-and-Other-Season-Extension-Techniques). In Arizona, they help mitigate intense summer heat. The **USDA Natural Resources Conservation Service** (NRCS) is sponsoring a High Tunnel System Initiative that provides funding for high tunnels: www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/?cid=stelprdb1046250.

PERMACULTURE

Permaculture is a whole systems approach to designing human habitats and food production based on ecological principles. There are numerous resources on permaculture and a good place to start is with **Trees Matter** (previously Valley Permaculture Alliance) (www.treesmatter.org), the **Sonoran Permaculture Guild** in Tucson (www.sonoranpermaculture.org), and **Watershed Management Group** in Tucson (www.watershedmg.org).

CONTROLLED ENVIRONMENT AGRICULTURE

Controlled environment agriculture (CEA) as an urban farming strategy has exploded in recent years. Its appeal stems from the ability to install systems in small spaces and its commercial potential.

Hydroponics: plants are grown either in sand or gravel or float in nutrient-rich water. Information on hydroponics is available from the USDA's **National Agricultural Library** (www.nal.usda.gov/afsic/hydroponics).

Aquaponics: plants and fish are grown in an integrated system.

The **USDA's National Agricultural Library** has compiled resources on system design, pros and cons, market outlook and guidelines: www.nal.usda.gov/afsic/aquaponics. In the Phoenix Metropolitan area, **Dr. George Brooks** teaches aquaponics courses at Mesa Community College and hosts an aquaponics discussion at www.nxthorizon.com. **RhibaFarms** in Chandler grows produce through biodynamic and aquaponic farming. Their produce may be purchased at several sites around the valley or through their website (www.rhibafarms.com/?view=arizona).

Aeroponics: plants are grown in air or mist system often with LED lighting. There are several commercial farms utilizing this method: see for example **AeroFarms** (www.aerofarms.com/technology) and **Aeroponics** (www.aeroponics.com). **True Gardens** in Mesa uses a state-of-the-art, vertical aeroponic system called Tower Gardens that are available for purchase. True Garden also offers workshops, a CSA, and a variety of seedlings (www.truegarden.com).



TOP: CONTROLLED ENVIRONMENT AGRICULTURE.
PHOTO BY DEB NYSTROM: FLICKR CC

ABOVE BOTTOM: HYDROPONICS SYSTEM.
PHOTO BY FRANK FOX: FLICKR CC



AQUAPONICS SYSTEM
IN A HOOP HOUSE.
PHOTO BY USDA:
FLICKR CC

Vertical Farming: plants are grown in controlled indoor environments such as warehouses, shipping containers, even spare rooms in homes, using precision systems that control lighting, nutrients and temperatures. It is called vertical because plants are grown in stacked trays. There has been a recent boom in vertical farms growing micro-greens for restaurants. An introduction to vertical farming and links to resources is available from the **National Center for Appropriate Technology** (www.attra.ncat.org/attra-pub/local_food/urban_ag.html).

Local farmers using indoor vertical farming systems include **Picked Fresh Farms** in Scottsdale, which delivers hydroponically grown produce year-round through its CSA (www.pickedfreshfarms.com).

ANIMALS AND BEES

Although poultry, rabbits, goats and bees are common on urban farms, the **City of Phoenix** only allows the keeping of poultry and bees. Guidelines for the number of animals or hives allowed and restrictions on siting are available at: www.codepublishing.com/AZ/Phoenix/frameless/index.pl?path=../html/phoenix08/phoenix08.html

For people interested in beekeeping, the **Beekeepers Association of Central Arizona** (www.azbeekeepers.org) has local information. **NASA's Goddard Space Flight Center** runs the **Honey Bee Net** program providing a wealth of information

regarding honey bees, climate change, Africanized bees, and colony collapse disorder (<https://honeybeenet.gsfc.nasa.gov>).

COVER CROPPING

Cover crops are planted at the end of the growing season to improve soil health, reduce erosion and weeds, control pests and increase biodiversity by attracting pollinators (www.sare.org/Learning-Center/Topic-Rooms/Cover-Crops). For information on summer cover crops in **Arizona** see www.extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1519.pdf.

COMPOST

Composting can be an integral part of urban farming operations, providing a cost-effective way to convert organic waste and create a healthy soil amendment. Before starting to compost, it is necessary to review and follow local zoning ordinances and laws. The **US Composting Council** provides links to state compost regulations (www.compostingcouncil.org/state-compost-regulations-map). For an introduction to composting in Arizona, the **University of Arizona College of Agriculture Cooperative Extension** has put together a short publication (www.extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1632-2014.pdf) and **Edible Baja Arizona's** article "Growing Garbage" is another informative source (www.ediblebajaarizona.com/growing-garbage).

Cornell University's Waste Management Institute is the definitive guide for composting methods (www.cwmi.css.cornell.edu/composting.htm).



VERTICAL GROWING SYSTEM AT GREENSGROW FARM IN PHILADELPHIA. PHOTO BY BLAINE O'NEILL: FLICKR CC



NATIVE AMERICAN STUDENTS LEARNING ABOUT BEES AT THE USDA CARL HAYDEN BEE RESEARCH CENTER IN TUCSON. PHOTO BY USDA: FLICKR CC

VERMICULTURE TRAINING AT GROWING POWER IN MILWAUKEE. PHOTO BY MATT MONTAGNE: FLICKR CC



Vermicomposting uses earthworms to convert organic materials and wastes, creating “compost tea” and worm castings. A comprehensive manual on vermicomposting and Vermiculture is available at www.oacc.info/docs/vermiculture_farmersmanual_gm.pdf. Also helpful is the **UA Cooperative Extension** article on Vermiculture (www.ag.arizona.edu/maricopa/garden/html/pubs/0803/worms.html).

PEST MANAGEMENT

The **Integrated Pest Management (IPM)** process works to control pests without the use of chemicals. Effective IPM reduces the negative impacts of conventional pest control by creating healthy ecosystems that support healthy crops. Detailed information is available at the University of Arizona’s **Arizona Pest Management Center** (www.cals.arizona.edu/apmc). See page 15 for more information on IPM.

FOOD SAFETY

Issues related to food safety pertain to production, processing and distribution. Urban farms interested in selling to schools and restaurants will have an easier time getting schools and restaurants to choose to buy from them if they have **Good Agricultural Practices (GAP)** and **Good Handling Practices (GHP)** certification, which are USDA programs. Training is cost-free and is available through the Arizona Department of Agriculture and the University of Arizona (www.cals.arizona.edu/fps/gap-training; www.agriculture.az.gov/good-handling-practices-and-good-agricultural-practices-ghpgap). There

is a charge for the audit for certification: farmers can apply for cost-share funds through the Arizona Department of Agriculture (www.agriculture.az.gov/good-handling-practices-and-good-agricultural-practices-ghpgap). Further information is available at the **National Good Agricultural Practices Program at Cornell University** (www.gaps.cornell.edu).

Whether a farmer chooses to pursue GAP/GHP certification or not, food safety is a must. The University of Arizona’s Cooperative Extension **Fresh Produce Safety** website provides safety information for home and commercial growers (www.cals.arizona.edu/fps). The **Maricopa County Environmental Services Department** (www.maricopa.gov/631/Environmental-Services) and the **Arizona Department of Health Services** (www.azdhs.gov) also have information regarding safe food handling and permitting requirements for food processing.

Processing

Beyond selling simply what the farm produces – fruit, vegetables, or livestock – many urban farmers are making value-added products, transforming the raw farm products into food, personal care, craft products and more. Value-added products help boost farm income and expand the market season and the visibility of the farm. Deciding to get involved in creating new products generally calls for a long-term commitment in that it requires additional capital for infrastructure, compliance with food safety and labeling requirements, liability insurance, and marketing.

The **National Sustainable Agriculture Information Service** publishes an overview on value-added products that is a good resource for anyone interested in exploring the options and opportunities (www.attra.ncat.org/attra-pub/summaries/summary.php?pub=270). To spur innovation in value-added products and help offset costs, the **USDA Rural Development Department** offers **Value Added Producer Grants** for planning and for working capital (www.rd.usda.gov/programs-services/value-added-producer-grants). Grants are awarded annually.

Selling value-added products requires following federal, state and local regulations. As noted under Food Safety, training for the GAP and GHP audit programs is available through the AZ Department of Agriculture and the University of Arizona. Information on permitting and enforcement regulations for people processing foods for sale in Arizona is available through the **Maricopa County Environmental Services Department** (www.maricopa.gov/631/Environmental-Services) and the **Arizona Department of Health Services** (www.azdhs.gov).

The **Arizona Department of Agriculture** offers an “**Arizona Grown**” trademark program for food and agricultural products grown or processed in Arizona (www.agriculture.az.gov/arizona-grown; www.arizonagrown.org).

Agritourism is another type of value-added product that continues to grow in popularity. In this case, the product is the farm experience. Agritourism offers opportunities to connect people to culinary heritage and educational school field trips and many other experiences. Common examples

include U-pick farms, petting farms, corn mazes, winery tours, harvest festivals, on-farm B&Bs, wedding venues, hunting and fishing, riding stables and cooking classes. The **University of California Small Farm Program** has developed an Agritourism guide for interested farmers (www.sfp.ucdavis.edu/agritourism) as has the **USDA Natural Resources Conservation Service** (www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_009750). The **Agricultural Marketing Resource Center** also has many online resources (www.agmrc.org/commodities-products/agritourism/agritourism-checklists/online-agritourism-resources). The **Arizona Experience** features online Agritourism maps by activity type (www.arizonaexperience.org).

Distribution (and Marketing)

Connecting urban farm products to consumers occurs through many different channels. There are direct-to-consumer methods such as farmers’ markets or Community Supported Agriculture (CSA) programs, direct-to-institution, farm to school and farm to restaurant strategies. There are also retail options where farm products are distributed through food cooperatives, mobile markets, grocery stores or healthy vending machines. And there are food hubs and producer marketing cooperatives that aggregate farm products for distribution. The **USDA National Agricultural Library** offers information on many types of marketing and is a good place to begin researching marketing options (www.nal.usda.gov/afsic/marketing-0) as is the **Agricultural Marketing Resource Center** (www.agmrc.org).



VALUE-ADDED
FARM PRODUCTS.
PHOTO BY
MARK KALETKA:
FLICKR CC

Direct marketing refers to distribution strategies where the farmer and consumer connect. The most popular forms include CSAs and other membership-based farms; farmers' markets, on-farm stands and roadside stands; U-Pick enterprises; farm to school or restaurant; and, increasingly, online purchasing. The **University of Florida Institute of Food and Agricultural Sciences** (UF/IFAS) provides a brief overview of direct marketing, examples and the advantages and disadvantages of each (www.edis.ifas.ufl.edu/fy597). For a definitive resource on direct marketing strategies for small farms, the **University of California Center for Agroecology & Sustainable Food Systems** publishes a nine-chapter guide (<http://casfs.ucsc.edu/about/publications/Teaching-Direct-Marketing/index.html>).

Community Supported Agriculture: CSAs are membership-based programs where consumers purchase a share in a farm in exchange for a weekly box of farm-grown produce.

The **USDA National Agricultural Library** has compiled information on CSAs that covers everything from its history, types and strategies, how to market your CSA and links to national, state and regional directories (www.nal.usda.gov/afsic/community-supported-agriculture).

Farm to School: local farmers sell produce directly to schools. The **Healthy, Hunger-Free Kids Act of 2010** and the **USDA Farm to School Grant Program** provide annual funding to support getting locally grown food into schools (www.fns.usda.gov/farmtoschool/farm-school-grant-program). The **National Farm to School Network** provides a wealth of information on the topic including Arizona specific resources (www.farmtoschool.org). **Cindy Gentry** heads the initiative in **Arizona** through her position as volunteer State Lead for the Network. Ashley Schimke is the Arizona Department of Education's Farm to School Specialist (www.azed.gov/health-nutrition/farm-to-school-programs).

Cooperatives: membership association that helps farmers market products (among other things) to consumers. The definitive resource on agriculture cooperatives is through the **USDA Rural Development** department (www.rd.usda.gov/programs-services/all-programs/cooperative-programs). The site also features information on funding opportunities to support cooperatives. The **UC Small Farm Program** also is useful for information on what cooperatives are, how they work and new evolving forms (www.sfp.ucdavis.edu/cooperatives/what_is).

The most popular **intermediary distribution** method is the food hub. **Food hubs** aggregate local agricultural products and market and distribute them to wholesale, retail and institutional consumers. Food hubs have been gaining traction across the country as viable solutions for supporting local producers and building participation in local food systems. The **National Good Food Network's Food Hub Center** brings together resources on all aspects of food hubs including national benchmark studies, webinars, case studies, research and regional guides (www.ngfn.org/resources/food-hubs). The **USDA Agricultural Marketing Service** has additional food hub information and publishes some reports in both English and Spanish (www.ams.usda.gov/services/local-regional/food-hubs).



TOP: SINGH FARMS MARKETS SEVERAL PRODUCTS SUCH AS COMPOST, CHICKENS AND EGGS AND FARM PRODUCE. THE POPULAR FARMERS MARKET HAS REOPENED IN TEMPE. PHOTO: DAVID CRUMMEY; FLICKR CC

ABOVE BOTTOM: WEEKLY OFFERING FOR CSA. PHOTO: SUZIE'S FARM; FLICKR CC

STARTING AN URBAN AGRICULTURE ENTERPRISE

Not surprisingly, starting an urban agriculture enterprise requires planning. To jumpstart the planning process, this section outlines the various elements to take into account when beginning a new project. The list should be considered as a starting point rather than a definitive guide.

Getting Started

Identify the project and define its purpose. Regardless if the enterprise is nonprofit or for-profit, identifying the target customers, what will be grown or produced, how and where it will be distributed, and what is the existing market is critical to the success of the business.

Engage the community. Work with community members to identify what is needed and what is desired. Brainstorm and get people involved and committed to a vision.

Visit existing farms to learn what others are doing. How will your project be the same or differ? Ask other farmers to share lessons they have learned.

Create a working group and an advisory group. Having a good advisory group is especially important for beginning farmers. Solicit the group's input and use the feedback to strengthen your plan.

Will the farm be nonprofit, for-profit or a combination of both?

- **Nonprofit urban agriculture:**

Nonprofit farms prosper with community participation and support. Seek out local residents and organizations, faith centers, community associations, local businesses and local government staff to help define the mission and goals. Create a planning committee from interested stakeholders and identify roles for individuals.

Identify partners to support the project throughout. These can be community organizations that will help with funding or technical assistance, other nonprofit

farms to share resources with, and municipal staff to assist with permitting and other regulatory matters.

- **For-profit urban agriculture:**

Identify your customer and determine what you will produce. Will you be selling direct to consumers or to restaurants or to a regional food hub?

Establish the type, scale and method for the project: vertical farming of micro-greens, aquaponics or hydroponics, intensive in-ground or beekeeping and chickens? Organic or natural?

Put together a team that includes advisors and partners (if necessary).

Put together a business plan that articulates the business structure, operating and marketing strategies and financial plan. Identify resources that will provide for start-up costs and ongoing funding needs. Sources may include donations from businesses in the form of expertise or materials. Solicit sponsorships and hold fundraisers. Ongoing income sources may be derived from fees for service from farm programs as well as sales.

Determine what type of labor is needed. Volunteer labor can only be used for nonprofit organizations. Will employees need to be skilled with specialized knowledge? Offering internships may be a viable strategy.

If possible, consider doing a pilot project to test your proposal. For urban agriculture on public land, a pilot introduces the project to the broader community and helps determine how it will fare in the long run.

Starting the Farm

Site selection and land tenure. If the farm will be on private property or public land, secure a lease of adequate time length. Alternatively, consider starting a community land trust if possible. This will allow for long-term security. Obtain necessary insurance. Be sure to investigate relevant tax breaks and deductions available for farming businesses. A good place to start is www.irs.gov/uac/newsroom/10-things-to-know-about-farm-income-and-deductions.

Site analysis: once a site has been selected, make sure it has the appropriate zoning and that the proposed farm complies with municipal policies. Secure the necessary permits.

As discussed earlier in the workbook, knowing the condition of the site's soil is essential. It is better to find out beforehand if you have selected a Superfund site and cannot disrupt the surface. Refer to that section for resource information.

Secure water access and devise an irrigation strategy that includes on-site harvesting.

Determine what type of infrastructure is necessary to support the proposed farm. This includes identifying any necessary structures such as sheds and storage facilities, greenhouses and hoop houses, and animal housing. Most urban farms require vehicular access and some parking. The **USDA's Farm Service Agency** offers loans for equipment and other farm-related expenses (www.fsa.usda.gov/state-offices/Arizona/index) and the **USDA's Natural Resources Conservation Service – Arizona** also has financial assistance information (www.nrcs.usda.gov/wps/portal/nrcs/site/az/home).

Site design. Develop a site plan that incorporates all needed elements in a functional manner. Elements to consider include: production areas; circulation, both roads and pathways; composting area; structure placement; siting for a farm stand; irrigation plan; fencing; and existing features such as trees and buildings.

Put together a cost estimate that includes demolition as well as installation. It may be necessary to do the installation in phases.

Operating and Sustaining the Farm

Operating a farm entails maintaining food and worker safety, managing pests, overseeing harvesting and post-production activities, ongoing marketing efforts, and rigorous data collection. Understanding details about how the farm is functioning allows the operation to be fine-tuned, enhancing its long-term viability. The **Design Trust for Public Space** and **Farming Concrete** created an online toolkit to assist urban farmers with measuring farm performance and outcomes. Farmers can generate reports and figures on the site to use to secure future funding and demonstrate the impact their farm has on the community (www.farmingconcrete.org).



PHOTO BY NICK ALLEN: FLICKR CC

INCUBATOR FARMS

Incubator farms are a cost effective way for beginning farmers to start farming by providing access to land, credit, technical assistance, business planning, agricultural training, farm equipment and more. National Incubator Farm Training Initiative (www.nesfp.org/farmer-training/incubator-farm) features a toolkit and other resources for incubator farms. Viva Farms in the Skagit Valley began in 2009 by providing new farmers land, equipment, training (in English and Spanish), marketing and access to low interest loans and grants (www.vivafarms.org).

RESOURCE GUIDE

Arizona resources are noted with a ★.

National, State and Local Resources: Agencies and Universities

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)

The USDA provides resources on all aspects of agriculture through its numerous agencies and offices. Responding to growing interest in urban agriculture, the USDA has developed a variety of resources aimed at novice to experienced farmers. The Department has a quick reference guide that summarizes the focus of each of these.

www.usda.gov/documents/about-usda-quick-reference-guide.pdf

NATIONAL AGRICULTURE LIBRARY

USDA's National Agriculture Library site connects urban farmers with national and international resources including guides for creating business and marketing plans, reports on best practices and possibilities, information on soil issues and building food security, among other topics.

www.nal.usda.gov

★ NATURAL RESOURCES CONSERVATION SERVICE – ARIZONA

The USDA's Natural Resources Conservation Service – Arizona provides information on a range of topics including soil surveys, a plants database, water and snow survey, and more. NRCS programs include conservation and land easements and financial assistance.

www.nrcs.usda.gov/wps/portal/nrcs/site/az/home

RURAL DEVELOPMENT

The USDA's Rural Development Department has created several publications addressing local and regional food systems, community economic development, faith-based and neighborhood partnerships and American Indian and Alaska Native programs that are relevant to urban agriculture. Examples include a three-part series on running a food hub, how to create and manage a cooperative, and online training webinars on food systems and food financing.

www.rd.usda.gov

SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION (SARE)

The USDA's SARE program offers grants to producers, professionals, students, researchers and others. Grants may be used for on-site experiments, professional development and other projects that explore innovations in agriculture. The SARE website features an agricultural learning center with resources in the form of videos, curricula, books, fact sheets and reports.

www.sare.org

PEOPLE'S GARDEN INITIATIVE

The People's Garden Initiative is a collaborative effort between USDA, federal, state and local partners to grow "healthy food, people and communities." The website features numerous resources such as instructional webinars and videos, guidance on different sustainable practices, potential funding sources, marketing guides, a national map of People's Gardens and information on how to become one, and more.

<https://peoplesgarden.usda.gov>

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

As part of its Brownfields Program, the EPA has created a variety of urban agriculture resources for farmers and communities. To address the increasing number of urban farms that are sited on contaminated land or brownfields, the EPA has developed a step-by-step guide for safe growing practices (www.epa.gov/brownfields/brownfields-and-urban-agriculture-interim-guidelines-safe-gardening-practices and www.clu-in.org/ecotools/urbangardens.cfm). Additional resources include guides for elder accessible gardening, integrated pest management, environmental justice, food waste recycling and food systems 101 (www.epa.gov/brownfields/urban-agriculture-resources-related-links).

The EPA also has created an Urban Farm Business Plan Handbook (including financial spreadsheets) for people interested in starting and operating nonprofit or for-profit urban farms (www.epa.gov/brownfields/urban-farm-business-plan-handbook).

USDA FOR KIDS

USDA for Kids offers a variety of informational guides and activities for kids, primarily of elementary and middle school age. The topics include everything from identifying harmful insects and food bacteria to learning about conservation practices and outdoor fire safety.

www.usda.gov/wps/portal/usda/usdahome?navid=FOR_KIDS

★ UNIVERSITY OF ARIZONA COLLEGE OF AGRICULTURE AND LIFE SCIENCES COOPERATIVE EXTENSION (CALs-CE)

UA's CALs-CE website is an excellent resource for information on agriculture in Arizona. Resources, guides, and publications cover a wide range of topics including agriculture and food safety, water conservation and harvesting, aquaculture, citrus management, school garden certification, agricultural literacy, pest management and more. Links to agriculture- and food-related projects throughout the state also can be found on the website.

www.extension.arizona.edu

★ CONTROLLED ENVIRONMENT AGRICULTURE CENTER (CEAC)

The University of Arizona's CEAC offers courses, research and other resources on all aspects of controlled environment agriculture including hydroponics, aquaponics, lighting systems, climate control, pest management, and crop production.

www.ceac.arizona.edu

UNIVERSITY OF CALIFORNIA DIVISION OF AGRICULTURE AND NATURAL RESOURCES (UCANR)

The UCANR has compiled a comprehensive set of resources for anyone interested in starting an urban farm or already involved in urban farming. Resources available include: a start-up guide; business management; all aspects of production; food safety, handling and processing; community and school gardens; laws, zoning and regulations; current research; case studies; and a blog.

www.ucanr.edu/sites/UrbanAg

UNIVERSITY OF FLORIDA INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES (UF/IFAS)

The UF/IFAS offers numerous resources related to urban agriculture, many of which are applicable beyond Florida. Examples include instructions on how to build a floating hydroponic garden, how to raise poultry including what type of housing to use, and information on micro-irrigation systems. Many of the publications and resources are in both English and Spanish.

<http://pinellas.ifas.ufl.edu/urban-ag.shtml>

UNIVERSITY OF CALIFORNIA CENTER FOR AGROECOCLOGY & SUSTAINABLE FOOD SYSTEMS (UC-CASFS)

The UC-CASFS publishes comprehensive guides on organic agriculture and direct marketing for small farms as well as other topics.

<http://casfs.ucsc.edu/index.html>

NORTH CAROLINA COOPERATIVE EXTENSION (NC STATE UNIVERSITY AND NC A&T STATE UNIVERSITY)

NC Cooperative Extension provides a variety of resources on all things urban agriculture as well as links to publications developed by outside organizations and agencies.

<https://localfood.ces.ncsu.edu/local-food-production/local-food-urban-agriculture>

LEOPOLD CENTER FOR SUSTAINABLE AGRICULTURE AT IOWA STATE UNIVERSITY

The Leopold Center long has been a leader in sustainable agricultural practices, developing innovative practices and tools that will be helpful to urban agriculture practitioners. Available resources include manuals, tools, and guides addressing post-harvest handling, machinery sharing, produce profitability, nutrient management, high tunnel use, grower cooperatives and more.

www.leopold.iastate.edu

Urban Agriculture Toolkits, Handbooks and Guides

USDA URBAN AGRICULTURE TOOLKIT

The US Department of Agriculture released a toolkit in spring 2016 that outlines the central elements of starting or expanding an urban farm. The toolkit identifies resources for each element including financial, technical, federal, state and local sources. It is an excellent resource and good starting place for anyone trying to locate information for the first time.

www.usda.gov/sites/default/files/documents/urban-agriculture-toolkit.pdf

USDA MARKET NEWS

The Agricultural Marketing Service (AMS) of the USDA provides free, unbiased price and sales information to assist people in the agricultural sector "evaluate market conditions, identify trends, make purchasing decisions, monitor price patterns, evaluate transportation equipment needs and accurately assess movement." Data is provided for crops, livestock, and local and regional foods. The website includes a tool that creates custom reports.

www.ams.usda.gov/market-news

USDA NEW FARMERS DISCOVERY TOOL

Portal for accessing resources for the beginning farmer. Specific sections addressed to new farmers, women in agriculture, youth and veterans. The website also features stories for inspiration.

<https://newfarmers.usda.gov>

USDA THE ECONOMICS OF LOCAL FOOD SYSTEMS

Created by the USDA's Agricultural Marketing Service, this toolkit assists communities in discussing, assessing and making choices regarding local food systems.

www.ams.usda.gov/sites/default/files/media/EconomicofLocalFoodSystemsToolkit.pdf

USDA REGIONAL FOOD HUB RESOURCE GUIDE

This guide details how to develop or participate in a food hub and includes information on funding sources and opportunities, innovative practices, social and environmental impacts, challenges and barriers, and economic viability.

www.ams.usda.gov/sites/default/files/media/Regional%20Food%20Hub%20Resource%20Guide.pdf

USDA NATURAL RESOURCES CONSERVATION SERVICE – URBAN SOILS

General information on soils as well as a technical guide, Urban Soil Primer, written for homeowners, renters, planning boards and other community members. Links to other resources are listed.

www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/urban

EPA URBAN AGRICULTURE HANDBOOKS

The US Environmental Protection Agency has developed several urban agriculture resources including important guidelines for farming on brownfields: *Brownfields and Urban Agriculture: Interim Guidelines for Safe Gardening Practices*, and a detailed guide for developing a business plan, *Urban Farm Business Plan Handbook*. The business plan handbook is suitable for nonprofit and for-profit businesses.

www.epa.gov/brownfields/brownfields-and-community-supported-agriculture

NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY (NCAT) NATIONAL SUSTAINABLE AGRICULTURE INFORMATION SERVICE (ATTRA): URBAN AGRICULTURE

An extensive array of guides, toolkits, webinars, videos and links to other resources for many aspects of urban agriculture are available at this site. Topics include: starting an urban farm; vertical farming; business planning and marketing; zoning and policy; urban soils; crop and livestock production; controlled environment agriculture; risk management; community orchards; and community supported agriculture.

www.attra.ncat.org/urban_ag.html

POLICYLINK EQUITY TOOLS

PolicyLink created several tools to assist people, communities, organizations and local governments develop healthy communities by “reversing patterns of segregation and disinvestment, preventing displacement, and promoting equitable revitalization.” Equity tools related to urban agriculture include: Access to Healthy Food; Equitable Food Hubs; Farmers’ Markets; and Urban Agriculture and Community Gardens. Three additional tools – Corner Stores, Grocery Stores and Local Food Procurement – may also be of interest.

www.policylink.org/equity-tools/equitable-development-toolkit/health-equity-and-place

LEOPOLD CENTER FOR SUSTAINABLE AGRICULTURE COOL TOOLS

The Leopold Center has developed a variety of tools and guides to assist farmers and made them available on the “Cool Tool” website. Helpful tools include a resource guide for beginning farmers, a toolkit for urban agriculture, grower cooperatives information, business management guides, information on machinery sharing, and a post-harvest handling tool with information on food safety and regulations. Also available is a produce profitability calculator and a US food market estimator – both invaluable resources.

www.leopold.iastate.edu/cool_tools

WALLACE CENTER

The Wallace Center supports collaborations between communities, entrepreneurs, practitioners, researchers and others in building a sustainable food system that is “healthier for people, the environment, and the economy.” Projects supported by the Wallace Center include the Food Hub Collaboration, the National Good Food Network, Community Food Enterprise, Healthy Urban Food Enterprise Development, City Food Sector Innovation and Investment, and the Field Guide to the New American Foodshed. A wealth of resources, toolkits, guides, webinars, and research is available on the website.

www.wallacecenter.org

HEALTHY COMMUNITY FOOD SYSTEMS (HCFS)

HCFS offers several food system tools on its website and also provides technical assistance. Topics covered include: rebuilding your local food system; farm to school; climate-friendly food systems; biodiverse and wildlife friendly food systems; native farming practices; food safety for small producers; and incorporating sustainability into your marketing.

www.healthycommunityfoodsystems.org

RUAF FOUNDATION

The RUAF Foundation is an international center providing information on all aspects of urban agriculture. RUAF resources include training modules, advisory services, publications and an extensive array of manuals addressing everything from composting and Vermiculture to hydroponics and rainwater harvesting.

www.ruaf.org

URBAN AGRICULTURE: BEST PRACTICES AND POSSIBILITIES

University of Missouri Extension

This report synthesizes urban agriculture and local food system resources drawn from across the US and Canada. Topics covered include municipal regulations, funding, soil issues, food policy councils and local food system infrastructure. The appendix features a list of municipal agencies from numerous cities that support urban agriculture.

www.extension.missouri.edu/foodsystems/survey.aspx

THE FARM INCUBATOR TOOL KIT: GROWING THE NEXT GENERATION OF FARMERS

New Entry's National Incubator Farm Training Initiative

This "comprehensive guide to starting and operating a land-based beginning farmer training program" covers planning, developing and managing a farm incubator project as well as case studies from 13 existing incubators.

www.nesfp.org/resources/farm-incubator-tool-kit-growing-next-generation-farmers

www.nesfp.org/food-systems/national-incubator-farm-training-initiative

STARTING A FARM IN YOUR CITY: TRANSFORMING VACANT PLACES

Delta Institute

This "GO-Guide" provides a good overview for anyone interested in urban farming. The guide moves step-by-step through the various elements of starting and sustaining an urban agriculture project. A list of federal financing sources as well as additional general resources is included. The website also links to other guides that may be relevant to certain urban farming enterprises.

www.delta-institute.org/tools

★ ARIZONA GARDENS FOR LEARNING: CREATING AND SUSTAINING YOUR SCHOOL GARDEN

Western Growers Foundation – Collective School Garden Network

This comprehensive resource guides schools through the process of starting and sustaining a school garden, covering everything from planning, planting and working with volunteers to securing resources and linking the garden to the curriculum.

www.csgn.org/csystg

FARMING CONCRETE TOOLKIT

In partnership with farmers, gardeners and the Design Trust for Public Space, Farming Concrete created a data collection toolkit to measure and track productivity and impact of urban farms. The toolkit outlines methods for collecting data in five areas: food production; environmental; social; health and economic. Instructional videos are available for further clarification. In addition to guides and worksheets, the toolkit features an online platform for storing collected data. The data can then be converted into reports with graphs, useful when reporting to funders or other stakeholders.

www.farmingconcrete.org

FIVE BOROUGH FARM: SEEDING THE FUTURE OF URBAN AGRICULTURE IN NEW YORK CITY

FIVE BOROUGH FARM: GROWING THE BENEFITS OF URBAN AGRICULTURE IN NEW YORK CITY

Design Trust for Public Space: Five Borough Farm

These two publications provide a wealth of material on all facets of urban agriculture. Topics discussed include the following: working with stakeholders; identifying needs and challenges; working with city government to implement policies and plans; funding and grants; evaluation and data collection; and maximizing and scaling benefits. The chapters on metrics, evaluation and data collection are particularly important.

www.fiveboroughfarm.org

NORTHEAST BEGINNING FARMERS PROJECT

Cornell University

Although developed for beginning farmers in the Northeast, this project offers a wealth of excellent resources for new farmers. Tutorials cover everything a new farmer needs to know from the first step of goal-setting to developing farming skills to information on taxes and regulations. There are videos, publications and worksheets on each topic as well as links for further information. Online courses are offered for those interested in learning in that format.

www.nebeginningfarmers.org

CORNELL WASTE MANAGEMENT INSTITUTE

The Cornell Waste Management Institute (CWMI) at Cornell University provides training, technical assistance and research resources on different types of waste including composting, farm waste management, soil quality, and health and safety. In addition to detailed publications, a series of factsheets covering a wide range of waste-related topics are available for download. Compost factsheets contain marketing information as well as how-to guides.

www.cwmi.css.cornell.edu/index.html

MANUAL OF ON-FARM VERICOMPOSTING AND VERICULTURE

Organic Agriculture Centre of Canada (OACC)

Comprehensive manual on all things related to vermicomposting and Vermiculture. Although not specifically focused on urban agriculture, the OACC also has numerous other excellent resources covering all aspects of organic agriculture.

www.dal.ca/faculty/agriculture/oacc/en-home/resources/soils-fertility/composting.html

INTEGRATING URBAN FARMS INTO THE SOCIAL LANDSCAPE OF CITIES: RECOMMENDATIONS FOR STRENGTHENING THE RELATIONSHIP BETWEEN URBAN FARMS AND LOCAL COMMUNITIES

Center for a Livable Future Johns Hopkins Bloomberg School of Public Health

This guide presents recommendations derived from urban farmers, neighborhood leaders, community members and other stakeholders for increasing acceptance of urban farms by local residents. The recommendations fall into three categories: 1) gaining entry into the neighborhood; 2) introducing the idea for an urban farm; and 3) engaging the neighborhood. Within each category, a variety of actions are discussed that may be used when planning a new urban farm.

www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/_pdf/projects/urban-soil-safety/Community%20buy-in%20for%20urban%20farms_July2014_Full%20report.pdf

Policy and Advocacy

★ MARICOPA COUNTY FOOD SYSTEM COALITION

Mission: To support and grow a food system in Maricopa County that is equitable, healthy, sustainable, and thriving. Volunteer organization developing all aspects of the local food system; five workgroups and two committees focusing on different topics.

www.marcofoodcoalition.org

URBAN AGRICULTURE SEARCHABLE DATABASE

University of Missouri Extension

The University of Missouri Extension created a searchable database of resources and ordinances in the US and Canada. The database can be searched by city, state, country, author, category or keyword. New resources are being added continuously.

www.extension.missouri.edu/foodsystems/policysearch.aspx

SEEDING THE CITY: LAND USE POLICIES TO PROMOTE URBAN AGRICULTURE

ChangeLab Solutions

This toolkit discusses land use policy affecting urban agriculture including laws, zoning and regulations and also includes a section on land preservation strategies. The toolkit also contains model language for both a comprehensive plan and zoning ordinance for urban agriculture for use by local organizations and policymakers.

www.changelabsolutions.org/publications/seeding-city

DIG, EAT, AND BE HEALTHY: A GUIDE TO GROWING FOOD ON PUBLIC PROPERTY

ChangeLab Solutions

Information on working with public agencies to identify available land, descriptions of legal agreements – leases, licenses and joint use agreements – and the various provisions commonly included, and factors specific to growing food at schools is considered in this toolkit. Links to sample agreements and additional resources are included.

www.changelabsolutions.org/publications/dig-eat-be-healthy

URBAN FOOD FORESTRY

Information on urban food forestry for individuals, communities, municipalities and researchers. Resources include information on tree species, policy documents and templates, how-to-guides, initiative examples, and design suggestions.

www.urbanfoodforestry.org

PUBLIC HARVEST: EXPANDING THE USE OF PUBLIC LAND FOR URBAN AGRICULTURE IN SAN FRANCISCO

SPUR

Although this report focuses on accessing public land for urban agriculture in San Francisco, the information, methods, strategies and recommendations offered are relevant to efforts in other cities.

www.spur.org/publications/spur-report/2012-04-23/public-harvest

GROWING URBAN AGRICULTURE: EQUITABLE STRATEGIES AND POLICIES FOR IMPROVING ACCESS TO HEALTHY FOOD AND REVITALIZING COMMUNITIES

PolicyLink

Policies, programs, strategies and practices to build and sustain urban agriculture projects in low-income communities and communities of color are presented. Topics addressed include land access and tenure, business training, costs and revenue generation, and evaluation tools. Several case studies profile successful urban agriculture projects.

www.policylink.org

URBAN AGRICULTURE: GROWING HEALTHY, SUSTAINABLE PLACES

American Planning Association (APA)

This comprehensive report provides detailed guidance on all facets of urban agriculture especially as it relates to city planning. Appendices cover inclusion of urban agriculture in city ordinances, plans, and regulations. The report is available for purchase at the APA website or on Amazon.

www.planning.org/research/urbanagriculture

HEALTHY FOOD IN YOUR COMMUNITY: A TOOLKIT FOR POLICY CHANGE

Union of Concerned Scientists

This toolkit focuses on the food policy system as a whole, providing guidance on how to affect local policy decisions. Areas addressed include planning, licensing and permitting, land use and zoning, financial tools, food regulations, building partnerships, and taking action. Evidence-based information and data visualization tools also are available.

www.ucsusa.org/center-for-science-and-democracy/connecting-scientists-and-communities/healthy-food-community-toolkit#.V3sEBo730nj

URBAN AGRICULTURE & SUSTAINABLE FOOD SYSTEMS: A RESOURCE GUIDE FOR LOCAL LEADERS

Institute for Sustainable Communities

This guide provides an overview of key aspects of food systems and urban agriculture, highlighting practices, programs and policies used in communities across the country. The guide is intended to assist community leaders and local governments develop appropriate policies and support local practitioners.

www.sustainablecommunitiesleadershipacademy.org/

★ GOOD LAWS, GOOD FOOD: PUTTING FOOD POLICY TO WORK IN THE NAVAJO NATION

Indian Health Service

This Toolkit aims to bolster the efforts to increase food sovereignty on the Navajo Nation by describing existing laws and policies that impact the Navajo food system, highlighting innovative efforts to improve food policy by other tribal and local communities, and offering strategies to advocate for policy change. The Toolkit is intended to serve as a reference for community leaders, food advocates, and members of the Navajo government, federal government, state governments, and local Chapter governments. (description is quoted from the website)

www.copeprogram.org/foodaccess

www.pih.org/country/navajo-nation

NATIONAL BLACK FARMERS ASSOCIATION

The National Black Farmers Association provides small and disadvantaged farmers with technical assistance and to gain access to state and federal agriculture programs. The Association was founded by John Boyd, Jr., a fourth generation farmer, to fight discriminatory lending practices employed by the USDA.

www.blackfarmers.org

THE COLOR OF FOOD

The Color of Food is a multimedia project advancing the “stories of Black, Latino, Indigenous and Asian farmers and food activists working to revolutionize the food system in our communities.” The project consists of a book, storytelling, and map of farms, markets, and organizations “led by people of color, not in service of these communities.”

www.thecoloroffood.com

NATIONAL SUSTAINABLE AGRICULTURE COALITION (NSAC)

NSAC “advocates for federal policy reform for the sustainability of food systems, natural resources, and rural communities.” In addition to its advocacy work, NSAC provides publications on a variety of issues, including local regional food systems and food safety and hosts a blog on the website.

www.sustainableagriculture.net

GROWING FOOD & JUSTICE FOR ALL INITIATIVE (GFJI)

GFJI works to “dismantle racism and empower low-income and communities of color through sustainable and local agriculture.” Hosted by Growing Power, GFJI supports building a network of engaged individuals and community-based organizations to develop and enact policies that promote justice, economic opportunity and equity. GFJI’s website includes a forum and links to resources.

www.growingfoodandjustice.org

Education, Certifications, and Online Courses

★ MASTER GARDENER TRAINING

University of Arizona College of Agriculture & Life Sciences
Maricopa County Cooperative Extension

Taught by UoA faculty, industry professionals and other horticulture experts, the program teaches the baseline fundamentals of selecting, installing, and maintaining healthy, appropriate landscapes and gardens for the Arizona low desert. Participants must complete the initial training class and donate 20 hours of volunteer service.

<https://extension.arizona.edu/maricopamg>

★ MARICOPA COUNTY BEGINNING AND SMALL FARMS PROGRAM

University of Arizona College of Agriculture and Life Sciences Cooperative Extension (CALs-CE)

Turning Dreams into Reality: Starting a Farm in Arizona is a two-day workshop that “connects existing and prospective producers with University and outside resources and also provides participants with information on specific topics such as pest management and organic production techniques.”

www.extension.arizona.edu/maricopa-county-beginning-and-small-farms-program

★ THE ARIZONA GOOD AGRICULTURAL PRACTICES/GOOD HANDLING PRACTICES CERTIFICATION PROGRAM

Good Agricultural Practices (GAP) and Good Handling Practices (GHP) audit programs were developed by the USDA and are recommended by the US Food and Drug Administration (FDA) to promote food safety by minimizing microbial contamination in the production, processing and distribution of fruits and vegetables. While the audits and certification are voluntary, many schools, grocery stores, and restaurants require safety certification in order to purchase produce. The two-day certification training in Arizona is offered through the Arizona Department of Agriculture and the University of Arizona and is cost-free for participants. USDA audits are valid for one year.

www.cals.arizona.edu/fps/gap-training

www.agriculture.az.gov/good-handling-practices-and-good-agricultural-practices-ghpgap

Additional information is available at:

National Good Agricultural Practices Program at Cornell University
www.gaps.cornell.edu

National Sustainable Agriculture Coalition

www.sustainableagriculture.net/publications/grassrootsguide/food-safety/good-agricultural-practices-and-good-handling-practices-audit-verification-program/#eligible

★ CENTER FOR URBAN AGRICULTURE AT MESA COMMUNITY COLLEGE

The Center for Urban Agriculture promotes “education and public awareness of healthy eating and living through sustainable urban agriculture, aquaponics, and local food production.” The Center features “organic teaching gardens, an organic urban farm, a cutting-edge aquaponics learning lab and a teaching greenhouse.” Associate of Applied Sciences degrees are offered in Sustainable Agriculture and in Urban Horticulture.

www.mesacc.edu/departments/applied-sciences-and-technology/urban-horticulture/center-urban-agriculture

THE URBAN FARMER

Ten-week online course on farm profitability offered by urban farmer Curtis Stone.

www.theurbanfarmer.co

Legal Information

★ ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Resources for agriculture businesses including permitting, water and air quality, environmental contaminants, grant programs and more.

www.azdeq.gov

★ MARICOPA COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES

Important site for information on county permitting regulations and requirements, health code, and more.

www.maricopa.gov/631/Environmental-Services

FARM COMMONS

Farm Commons provides legal information for farmers on the following topics: land use, workers/employees, insurance and liability, sales and contracts, food safety, business transfer and tax. Some information is state-specific. Farm Commons also produces a variety of guides, flowcharts, checklists and model documents (most available for free download) as well as tutorials and webinars. Additional services, such as personal conversations, risk analysis, and in-depth audits, are provided for a small fee. Links to resources developed by other organizations are included.

www.farmcommons.org

NATIONAL CONFERENCE OF STATE LEGISLATURES (NCLS)

NCLS collates information from state legislatures on a variety of topics including agriculture, urban agriculture and food safety. The site is a helpful resource to learn what is happening in Arizona as well as for looking for model legislation enacted in other states.

www.ncsl.org/research/agriculture-and-rural-development.aspx

NATIONAL COMMUNITY LAND TRUST NETWORK: AGRICULTURE

Information regarding using community land trusts for urban agriculture projects is provided. Resources include toolkits, technical manuals, publications, videos and training materials. The website also hosts a community forum that connects with network members who can provide additional assistance.

www.clnetwork.org/topics/agriculture-non-residential-projects

CITY FARMS ON CLTS: HOW COMMUNITY LAND TRUSTS ARE SUPPORTING URBAN AGRICULTURE

Lincoln Institute of Land Policy

Publication discusses the use of community land trusts as a means to secure access to land for urban agriculture, “provide programmatic support and engage directly in food production.” Legal and structural aspects of CLTs is discussed and examples are provided.

www.lincolnst.edu/pubs/2376_City-Farms-on-CLTs--How-Community-Land-Trusts-Are-Supporting-Urban-Agriculture

GARDEN JUSTICE LEGAL INITIATIVE (GJLI)

The Public Interest Law Center

The Center publishes a variety of resources pertinent to urban agriculture including information on land trusts and utilizing vacant land.

www.pilcop.org/garden-justice-legal-initiative-gjli/#sthash.xtpWylhr.iqWBkSOP.dpbs

General Resources

USDA LOCAL FOOD INITIATIVES

The National Agricultural Library of the USDA maintains an extensive list of local food initiatives and directories to connect producers with other producers and relevant programs. This list includes everything from food hubs, CSAs and farmers’ markets to grant programs, farm loans and farm-to-school programs.

www.nal.usda.gov/exhibits/ipd/localfoods/exhibits/show/usda-local/ams-initiatives

★ ARIZONA DEPARTMENT OF HEALTH SERVICES

Resource for food safety and environmental health issues.

www.azdhs.gov

NEW ENTRY SUSTAINABLE FARMING PROJECT

New Entry is an initiative of Tufts University focused on training new farmers with a goal to “produce food that is sustainable, nutritious and culturally-appropriate and making this food accessible to individuals regardless of age, mobility, ethnicity, or socio-economic status.” New Entry offers distance learning courses, farm business planning guidance, a farmland matching service and other innovative resources.

www.nesfp.org

WHYHUNGER

WhyHunger supports “grassroots-led movements” working for food and social justice and human rights worldwide. WhyHunger’s website features a hotline that links people in the US to food resources. Several informative publications and guides also are available for download.

www.whyhunger.org

AGRICULTURAL MARKETING RESOURCE CENTER – AGMRC

AgMRC is a “national information resource for value-added agriculture” offering an extensive array of resources including an online curriculum, information on different markets, products and commodities as well as guidance on business development. AgMRC also has links to numerous directories and state resources.

www.agmrc.org

SEED SAVERS EXCHANGE

Seed Savers Exchange maintains a collection of over 20,000 heirloom and open-pollinated vegetable, herb and plant varieties. Network members exchange seeds with one another and may request seeds from the Exchange. Non-members may purchase seeds from the annual catalog, which features over 600 varieties.

www.seedsavers.org

★ NATIVE SEEDS/SEARCH

Native Seeds/SEARCH (NS/S) operates both a seedbank and a conservation farm “focused on conserving genetic resources from the southwestern US and northwestern Mexico.” NS/S also maintains a Cultural Memory Bank that collects, documents and preserves stories and agricultural traditions of Native American farmers. Seeds are available for purchase online and NS/S administers a Community Seed Grant program available to organizations working in the NS/S focus region.

www.nativeseeds.org

★ SANTA CRUZ VALLEY HERITAGE ALLIANCE

The Santa Cruz Valley Heritage Alliance promotes the “cultural diversity of the Santa Cruz Valley” through partnerships with “private businesses, nonprofit organizations, governments, tribes, and individuals of all ages.” The Alliance supports a Heritage Foods program that includes a Local & Heritage Foods Directory, a Regional Food Brand – Santa Cruz Valley Harvest, and a Heritage Tourism Guide. The interactive Heritage Map highlights agriculture and food destinations in the Santa Cruz Valley. The publication, State of Southwestern Foodsheds, is available on the website.

www.santacruzheritage.org

★ LOCAL FIRST ARIZONA

Local First Arizona (LFA) supports the Arizona economy by “educating citizens about local business ownership social equity, cultural diversity, environmental kinship and collaboration.” The LFA website features a local business directory, an online business impact tool, and economic studies. The business directory includes a category for local agriculture and food production. LFA members have access to networking events across the state.

www.localfirstaz.com

★ SOCIAL ECONOMY ARIZONA: FOOD AND URBAN AGRICULTURE

Social Economy AZ “connects students, researchers, community and entrepreneurs to both resources and each other.” The food and urban agriculture section includes general information, links to local and national organizations.

www.socialeconomyaz.org/food-and-urban-agriculture

★ SOUTHWEST MARKETING NETWORK

The network offers resources to help Southwestern (AZ, NM, CO, UT) “producers and communities develop new and improved markets and enterprises and to rebuild local food systems.”

www.swmarketingnetwork.org

★ SELECTING PLANTS FOR POLLINATORS: A REGIONAL GUIDE FOR FARMERS, LAND MANAGERS, AND GARDENERS

Pollinator Partnership

A guide for selecting plants for pollinators in Arizona, New Mexico and Texas.

www.pollinator.org/guides.htm

Municipal Urban Agriculture + Food Policy Action Plans

The following examples highlight how cities across North America are integrating urban agriculture and local food system support into the fabric of their communities. Reports for each city may be downloaded at the link provided. The list is by no means exhaustive.

LAS CRUCES URBAN AGRICULTURE AND FOOD POLICY PLAN

www.las-cruces.org/en/departments/community-development/planning-and-revitalization/urban-agriculture

CITY OF SEATTLE: FOOD ACTION PLAN

www.seattle.gov/environment/food/food-action-plan

FRESH: EDMONTON'S FOOD & URBAN AGRICULTURE STRATEGY

https://www.edmonton.ca/city_government/documents/FRESH_October_2012.pdf

GROWTO: AN URBAN AGRICULTURE ACTION PLAN FOR TORONTO

www.toronto.ca/legdocs/mmis/2012/pe/bgrd/backgroundfile-51558.pdf

VANCOUVER FOOD STRATEGY: BUILDING JUST AND SUSTAINABLE FOOD SYSTEMS

www.vancouver.ca/people-programs/vancouvers-food-strategy.aspx

Urban Agriculture Examples

AEROFARMS

World's largest indoor vertical farm growing 250+ varieties of leafy greens and herbs. Information on technology, environmental impact, and products is available on the website.

www.aerofarms.com

★ ARIZONA MICROGREENS

Located at the Brooks Community School in South Phoenix, Arizona Microgreens grows organic microgreens for customers throughout Arizona. As a social enterprise, Arizona Microgreens contributes to the local community through job creation and support of the Community School.

www.arizonamicrogreens.com

CITY-HYDRO

Vertical farm located in a spare bedroom that grows 80 different varieties of microgreens for local restaurants. Website provides information on City-Hydro systems.

www.city-hydro.com

FARMBOX GREENS

Grows thousands of pounds of microgreens annually in a few hundred feet of space - two small garages - using LED lighting and hydroponics in a climate controlled environment.

www.farmboxgreens.com

FARMS TO GROW, INC

Farms to Grow works with black farmers and underserved farmers around the country to promote “sustainable farming and innovative agriculture practices that preserve cultural and biological diversity and the agroecological balance of the local environment.” Through a variety of programs, the organization helps farmers keep their farms viable and introduces farming to a new generation. Programs supported by Farms to Grow include Gardens to Grow (school and child care center based), young chefs cooking and nutrition, Harvest Box CSA, farm to consumer and farm to school, and Freedom Farmers' Market.

www.farmstogrow.com

★ FLAGSTAFF COMMUNITY MARKETS

Flagstaff Community Markets is a food hub supporting local, independent producers and connecting them with local consumers. The market also features value-added products from local artisans – both food and craft products.

www.flagstaffmarket.com

FLEET FARMING

Fleet Farming employs a pedal-powered, hyperlocal urban farming model to cultivate and distribute locally grown food. The model entails converting lawns into “farmlettes” that are maintained and harvested by an intergenerational fleet of bike-riding volunteers. Based in Orlando, FL, Fleet Farming is expanding nationally and internationally. The Fleet Farming Toolkit is available for purchase at the website and includes information on the business model, legal forms and waivers as well as growing methods, processing logistics and administrative guides.

www.fleetfarming.com

THE FOOD PEDALERS AND VANCOUVER URBAN MICRO

Since 2009, The Food Pedalers have been growing microgreens in a shipping container greenhouse and delivering the produce by bicycle to customers and markets in Vancouver, BC. Founder Chris Thoreau offers guidance on starting microgreens businesses at Vancouver Urban Micro.

www.foodpedalers.ca/wordpressite

www.urbanmicro.ca

THE FOOD PROJECT

For twenty-five years, The Food Project (TFP) has engaged “young people in personal and social change through sustainable agriculture.” TFP’s nationally recognized model provides youth with a range of educational and experiential opportunities including job experience (paid) and knowledge of food justice issues. The project supports two farms, CSAs and farmers’ markets and offers several educational programs and consulting. TFP has developed a sustainable agriculture curriculum, a range of activities, and manuals, all available for download or purchase on the website.

www.thefoodproject.org

FREIGHT FARMS: LEAFY GREEN MACHINE

Freight Farms are self-contained, controlled environment farming systems housed in insulated shipping containers. Each Freight Farm features a hydroponic growing system optimized for efficient commercial food production. Full details including pricing, energy use, information on growing and projected yields and customer testimonials are available on the website.

www.freightfarms.com

[http://cdn2.hubspot.net/hubfs/466960/2016%20Sales%20Collateral%20/Freight%20Farms%20LGM%200verview_One%20Pager_OCT%20\(1\).pdf](http://cdn2.hubspot.net/hubfs/466960/2016%20Sales%20Collateral%20/Freight%20Farms%20LGM%200verview_One%20Pager_OCT%20(1).pdf)

GREENSGROW

Greensgrow is a nationally recognized leader in urban farming that “engages neighborhoods in cultivating social entrepreneurship, urban agriculture, and community greening.” Started in 1997 in Philadelphia, Greensgrow now includes a CSA, a farmstand, a community kitchen, a nursery, mobile markets and multiple farm locations.

www.greensgrow.org

GROWING POWER

Growing Power is a national nonprofit organization and land trust that works to provide equal access to healthy, affordable food for people in all communities. Through a wide range of programs, Growing Power provides “hands-on training, on-the-ground demonstration, outreach and technical assistance through the development of Community Food Systems.” Founded in Milwaukee by Will Allen, Growing Power now has farm programs in Madison and Merton, WI and Chicago, IL as well as satellite training sites in Arkansas, Georgia, Kentucky and Mississippi. Growing Power is a national model for urban agriculture education and outreach initiatives. The website provides information and resources on the organization’s many programs.

www.growingpower.org

★ ISKASHITAA REFUGEE NETWORK

The Iskashitaa Refugee Network works with United Nations refugees and asylum seekers in community-based food projects. The Tucson-based organization supports a harvesting and gleaning program, a series of food preservation workshops, and a mobile produce rescue that delivers vegetables to Mexico. Market on the Move (MoM) and Produce on Wheels (POW) are partners in the mobile produce rescue program.

www.iskashitaa.org

★ MAYA'S FARM

Located in South Phoenix, Maya’s Farm uses biodynamic farming methods and offers a CSA. The website links to educational resources and more.

www.mayasfarm.com

★ ORCHARD COMMUNITY LEARNING CENTER (OCLC)

OCLC is an urban farm and education center located in South Phoenix. The Center supports farm-to-table through its CSA; participates in local farmers’ markets; and offers year-round, project-based educational programs and a summer day camp for youth ages 5-18 with a focus on STEAM (Science, Technology, Engineering, Agriculture, Arts, Math) projects.

www.orchardlearningcenter.org

★ SAN XAVIER CO-OP FARM

Located on the Tohono O’odham Nation, the San Xavier Co-op Farm, through its Wild Food Community Harvest Program, “works with the local community to learn how to harvest, process and prepare traditional wild Sonoran Desert foods in a culturally and environmentally healthy way.” Co-op members sell farm produced foods through the Farm Store.

www.sanxaviercoop.org

★ THE SIMPLE FARM

This Scottsdale-based, three-acre Nubian goat and produce farm runs a Farm Shop that offers value-added products including popular caramels, and a membership program for produce.

www.thesimplefarm.net

★ STEADFAST FARM

Located in Queen Creek, Steadfast Farm grows over a 100 different vegetables and raises pigs, chickens, ducks, turkeys and honeybees. The farm has a CSA program, farmers' market, self-serve farm stand and several restaurants. The farm also offers a 3-month internship and volunteer opportunities.

www.steadfast-farm.com

★ TIGER MOUNTAIN FOUNDATION

Tiger Mountain Foundation runs urban gardens in South Phoenix: Garden of Tomorrow, Spaces of Opportunity Garden, and People's Garden. With a mission to "empower communities to better themselves from within," Tiger Mountain Foundation provides on-the-job training opportunities for youth and adults and serves as an intergenerational community hub for neighborhood residents.

www.tigermountainfoundation.org

★ VILARDI GARDENS

Vilardi Gardens propagates heirloom tomato, vegetable and herb transplants for whole-sale distribution to organic farmers, nurseries and farmers markets.

www.vilardigardens.com

VIVA FARMS INCUBATOR

Viva Farms is a business incubator that "helps new farmers learn how to farm and experienced farm workers establish their own business while minimizing start-up costs." The incubator provides access to land (0.25 to 5 acre parcels), equipment and infrastructure (tractors, tools, greenhouses, cold storage), training (bilingual (Eng/Esp) education and technical assistance), marketing (wholesale distribution and retail farm stand) and capital (low-interest loans and access to grant funding). Located on 33 acres of land leased from the Port of Skagit in northwestern Washington, Viva Farms has been supporting local farmers since 2009.

www.vivafarms.org

Grants and Funding Opportunities

AGFUNDER

Online marketplace for agriculture startups interested in raising investment capital. Agriculture companies can apply to be matched with an investor and receive support from AgFunder in the form of advice, partnership opportunities and networking. The annual investing report is available on the website.

www.agfunder.com

VALUE ADDED PRODUCER GRANTS

Helps agricultural producers enter into value-added activities related to the processing and/or marketing of bio-based, value-added products. Generating new products, creating and expanding marketing opportunities, and increasing producer income are the

goals of this program. You may receive priority if you are a beginning farmer or rancher, a socially-disadvantaged farmer or rancher, a small or medium-sized farm or ranch structured as a family farm, a farmer or rancher cooperative, or are proposing a mid-tier value chain. Grants are awarded through a national competition. Each fiscal year, applications are requested through a notice published in the Federal Register and through an announcement posted on grants.gov. (description quoted from website)

www.rd.usda.gov/programs-services/value-added-producer-grants

COMMUNITY FOOD PROJECTS COMPETITIVE GRANT PROGRAM

National Institute of Food & Agriculture Programs

Grants to organizations developing community food projects (CFP) that help promote self-sufficiency of low-income communities. Primarily interested in CFPs designed to increase food security by harnessing strengths, establishing links and creating systems that improve a community's control over access to food.

www.nifa.usda.gov/program/community-food-projects-competitive-grant-program-cfpcgp

Informational Websites and Podcasts

★ EDIBLE BAJA ARIZONA

Online magazine featuring articles and more on "food-related and food system topics specifically relevant to the Baja Arizona Foodshed." Website also features a blog, resources and place to advertise.

www.ediblebajaarizona.com

★ EDIBLE PHOENIX

EMagazine with informative articles on all aspects of urban agriculture; blog, job listings, advertising section, and information for educators.

www.ediblephoenix.ediblefeast.com

★ THE URBAN FARM PODCAST WITH GREG PETERSON

Hosted by Greg Peterson

Interviews with local and national practitioners on all things related to urban agriculture.

www.urbanfarm.org/blog/podcast

THE URBAN FARM & GARDEN SHOW

Hosted by Larry Stebbins and Craig McHugh

A show on urban agriculture in the western US. Hosts interview people involved in all aspects of urban agriculture and food-related topics.

www.urbanfarmandgarden.com

FARMER TO FARMER PODCAST

Host Chris Blanchard

Interviews on topics ranging from practical information on cultivation to how to market your farm to keeping business records. Episode 054 (February 18, 2016) features an interview with Erich Schultz of Steadfast Farm in Queen Creek, AZ.

www.farmertofarmerpodcast.com

MICHAEL POLLAN

Michael Pollan is the author of numerous books on food, plants and agriculture including *The Omnivore's Dilemma* and *The Botany of Desire*.

www.michaelpollan.com

PERMACULTURE VOICES

Hosted by Diego Footer

Informative interviews on all things permaculture: "helping you live a financially, environmentally and socially profitable life."

www.permaculturevoices.com

POLYFACE FARMS

Polyface Farms is a "family-owned, multi-generational, pasture-based, beyond organic, local-market farm" located in Virginia's Shenandoah Valley. Polyface's farming methods are highlighted in Michael Pollan's book, *The Omnivore's Dilemma*.

www.polyfacefarms.com/speaking-protocol/joels-bio

THE URBAN FARMER SHOW

Hosted by Diego Footer

Interviews with Curtis Stone, an urban farmer in British Columbia. Stone, who has farmed profitably on a 15,000 sq.ft. site for five years, discusses all aspects of urban farming including how to get started, what does and does not work, marketing strategies and more.

www.permaculturevoices.com/the-urban-farmer-show

URBAN AGRICULTURE: THE THIRD GREEN REVOLUTION

Hosted by Dickson Despommier and Vincent Racaniello

Covers a wide range of topics with a particular interest in vertical farming.

www.microbe.tv/urbanag

USDA FOOD HUBS

Food Hubs are an important subset of food value chains. Many farmers and ranchers, especially smaller and mid-sized operations, often lack the capacity to access retail, institutional, and commercial foodservice markets on their own, and consequently miss out on the fastest growing segment of the local food market. Numerous resources on food hubs and food value chains are available on the site.

www.ams.usda.gov/services/local-regional/food-hubs

Books

GROWING FOOD IN A HOTTER, DRIER LAND: LESSONS FROM DESERT FARMERS ON ADAPTING TO CLIMATE UNCERTAINTY

by Gary Paul Nabhan, PhD

Information on farming in the desert gleaned from traditional farmers across the planet is provided. The book includes descriptions, diagrams, plant lists and tested strategies for growing food, managing water and building healthy soil. Nabhan is the W.K. Kellogg Chair in Southwest Borderlands Food and Water Security at the University of Arizona.

HOW TO GROW MORE VEGETABLES (AND FRUITS, NUTS, BERRIES, GRAINS, AND OTHER CROPS) THAN YOU EVER THOUGHT POSSIBLE ON LESS LAND THAN YOU CAN IMAGINE (8TH EDITION)

by John Jeavons

This book provides a detailed explanation of how to use the Biointensive method to grow more productively on less space using less water and fertilizer than conventional methods. For more information and Spanish language resources visit Ecology Action.

www.growbiointensive.org/index.html

URBAN AGRICULTURE: FOOD JOBS AND SUSTAINABLE CITIES

by Jac Smit and Annu Ratta

This seminal work on urban agriculture covers everything from its history to its benefits, constraints and trends. Funded by the United Nations Development Program, the book is available online.

www.jacsmit.com/book.html

RAINWATER HARVESTING FOR DRYLANDS AND BEYOND

by Brad Lancaster

www.harvestingrainwater.com

BUILDING A HEALTHY ECONOMY FROM THE BOTTOM UP: HARNESSING REAL-WORLD EXPERIENCE FOR TRANSFORMATIVE CHANGE (CULTURE OF THE LAND)

by Anthony Flaccavento

www.kentuckypress.com/live/title_detail.php?titleid=4548#V73VMibn_DA

URBAN AGRICULTURE: POLICY, LAW, STRATEGY, AND IMPLEMENTATION

Edited by Lawrence E. Bechler, Martha Harrell Chumbler, and Sorell Elizabeth Negro

A current, practical resource that addresses many of the land use, environmental, and regulatory legal issues that confront local governments, property owners, businesses, nonprofit organizations, and neighborhood groups when urban gardening or farming.

<https://shop.americanbar.org/eBus/Store/ProductDetails.aspx?productId=201618498&topic=Zoning+Law---Real+Estate+Law%7EZoning+Law>

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WORK BOOK

OTHER WORKBOOK TOPICS

COMMUNITY GARDENS

A guide to understanding, starting and sustaining a community garden

CREATING RESILIENT COMMUNITIES

A how-to resource guide for cultivating resiliency in local communities

ARIZONA TREAT & REFER CORE EDUCATIONAL MODEL

Resources for high quality design and delivery

NO CHILD LEFT INSIDE

Community-based strategies for increasing physical activity among children, youth, adults and families