Tucson’s Urban Agriculture Network: A Resource Guide for Gardeners

Greening the Food Deserts of Tucson, Arizona

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Welcome to this guide, developed as part of the research project ‘Greening the Food Deserts of Tucson, Arizona’ through the Udall Center for Studies in Public Policy and the University of Arizona School of Geography and Development. Funded by the Agnese Nelms Haury Program for Environment and Social Justice, ‘Greening the Food Deserts of Tucson, Arizona’ is a project that uses the city of Tucson as a case study to integrate dimensions of social justice and environmental sustainability into applied research on food access. Specifically, this study was created to comprehensively examine how urban agriculture practiced in community and backyard gardens can help address food accessibility among vulnerable populations. Therefore, the project focuses on low-income, food desert neighborhoods with an emphasis on women, the elderly, recent migrants, and handicapped adults.

Community partners on this project include the Community Gardens of Tucson, Compass Affordable Housing, the Community Food Bank of Southern Arizona, the International Rescue Committee, as well as the e-network ‘Tucson Backyard Gardening’. In coordination with these community partners, the project assists in setting up a network of organizations working with low-income populations in food deserts. By means of direct research with gardeners and a spatial analysis of Tucson neighborhoods, the project identifies the benefits and barriers of urban agriculture in meeting the social, economic and technical needs of gardeners. In addition, it aids in the planting of native species around garden plots to facilitate the cooling of urban heat islands and to provide a habitat for essential pollinators. To promote water conservation in Tucson, participating community gardens were supplied with resources for the efficient maintenance of plot drip irrigation systems. The project also contributed to the development of a new community garden for low-income individuals living with disabilities, as well as to a fund that subsidizes community garden plot fees for low-income gardeners.

In this handbook, you will find a compilation of urban agriculture resources available to Tucson’s gardeners. This encompasses the organizations, businesses and councils working to provide gardeners with the knowledge, skills and materials to more successfully participate in urban community and backyard gardening. In addition, the handbook includes a collection of handouts created by local organizations to equip gardeners with basic, yet essential information, such as how to plant with the seasonal calendar, as well as repair drip irrigation lines. With Tucson’s rich agricultural history, we hope this informational guide will further connect local gardeners to the organizations, businesses and communities committed to building a healthy, sustainable food system in Tucson, Arizona.

Additional information, as well as the electronic version of this guide, can be found on our project website at www.geography.arizona.edu/greeningfooddeserts.

Sincerely,

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Tucson, UNESCO World City of Gastronomy

On December 11th, 2015, the United Nations Educational, Scientific and Cultural Organization (UNESCO) announced that Tucson would be inducted into its Creative Cities Network as a City of Gastronomy. The first City of Gastronomy in the United States, Tucson joined 115 cities in the global network thereby committing to the mission to creatively and collaboratively build urban landscapes that uphold the ideals of sustainable, equitable development.

Tucson was awarded this prestigious designation as it has a culturally rich connection to food and agriculture that is unique to the Sonoran Desert city. Dating back to 1500 BC, Tucson has the longest agricultural history in North America. Excavated archeological sites along the Santa Cruz River floodplain uncovered a sophisticated irrigation canal and field system that was built by the Tohono O’odham 4,000 years ago. Since then, agriculture practices have remained a focal point of economic development as the city has amended its zoning regulations to recognize and protect urban food production through community and backyard gardening. Additionally, Tucson’s food system has more regionally identifiable foods that are grown within 100 miles of its urban center than any other city in North America. Indicative of Tucson’s thriving food economy is its high proportion of locally owned bars and restaurants. Currently, two-thirds of Tucson’s 2500 bars and restaurants are independently owned with the food service industry comprising 14 percent of the local job market. Bringing together the community in celebration of its cultural heritage, Tucson hosts more than two dozen annual food festivals and fairs, including the Tucson Meet Yourself Folklife Festival and the Fourth Avenue Street Fair.

In the mission to build a vibrant and sustainable local food economy, Tucson, as a World City of Gastronomy, has identified the following goals:

1. Establish the Center for Food Justice, Security, and Innovation aimed to increase access to healthy foods, improve sustainable local food production and distribution, and expand job opportunities in the food industry;
2. Nurture cross-cutting approaches by engaging Creative Cities of Gastronomy and Literature to the Food & Farm Writing and Literature International Forum, focusing on the promotion and consumption of healthy foods;
3. Cooperate with other Creative Cities of Gastronomy on developing resources and strategies for conserving and disseminating heritage crop varieties, as well as promote the use of culturally appropriate, nutritious regional foods; and
4. Exchange best practices on how to support artisanal local producers, the development of cooperatives and public markets, urban food production, conservation, and distribution.
To learn more about Tucson’s designation as a City of Gastronomy, please visit the website of the Creative Cities Network (en.unesco.org/creative-cities/tucson), as well as the City of Tucson’s website (tucsonaz.gov/integrated-planning/tucson-unesco-city-gastronomy).

Food & Agriculture Advisory Councils in Arizona

Commission on Food Security, Heritage, and Economy
In concurrence with Tucson’s designation as a UNESCO World City of Gastronomy, the City Council voted to create a 17-member advisory committee called the Commission on Food Security, Heritage, and Economy. Comprised of local experts on food heritage, production and security, the overarching goal of the Commission is to assist the City in the mission to build an equitable and sustainable food system in Tucson. Currently, the objectives of the Commission are listed on the City of Tucson’s website as follows:

1. Advising the Mayor and Council on matters relating to food security, food heritage, and the food economy.
2. Providing a common forum to the member organizations for discussion and coordination of activities.
3. Fostering cooperation and efficiency among member organizations.
4. Developing food access, food security, nutrition, and economic development goals and targets; liaison with other U.S. and international communities to identify best practices; recommending strategies to meet those goals and targets; and identifying potential funding or other resources to implement those strategies.
5. Promoting ideas, practices, and programs to increase access to healthy foods, increase demand and markets for locally-produced foods, improve local food distribution, reduce food waste, expand composting and other uses of food waste, expand food industry job opportunities, and expand entrepreneur support.
6. Evaluating City policies and regulations for their impact on local food production, food access and security, and nutrition, and making recommendations to improve such policies and regulations.
7. At the discretion and express direction of the Mayor and Council, assuming and undertaking such other tasks or duties as would facilitate the goals and objectives of the CFSHE.

For more information about CFSHE, please contact the City Clerk’s Office at (520) 791-4213.

Pima County Food Alliance
Recognizing the need for a forum to mobilize the community around local food policies and initiatives, the University of Arizona Mel and Enid Zuckerman College of Public Health and the Community Food Bank of Southern Arizona founded the Pima County Food Alliance in 2011. Currently, there are 16 community members that voluntarily serve on the Leadership Council, each of whom fulfill multiple roles within Tucson’s food system. To date, one of the council’s most significant accomplishments
includes its advocacy efforts for city zoning codes that protect small-scale urban agriculture practices. In accordance with its mission to promote and build a healthy, sustainable food system, the Pima County Food Alliance has defined its organizational strategy as follows:

1. **Education:** Creating opportunities for coalition members, their families, friends, neighbors, schools, and elected officials to learn about the importance of sustainably growing and eating healthful food as well as relevant food policy issues.
2. **Networking:** Having a space to meet and learn from other food councils and individuals in the community who are involved in community-based food projects and programs.
3. **Outreach:** Meeting with and inviting other individuals, organizations, agencies and policy makers to collaborate around the goals of the group.
4. **Policy Change:** Determining what governmental, institutional, and corporate policies are barriers or opportunities to improve the conditions involved in growing and eating sustainable, local, and healthful foods. Work to promote healthy and sustainable policies based on community-wide collaboration.

For more information about the Pima County Food Alliance, please visit their website at [pimafoodalliance.org](http://pimafoodalliance.org).

**Arizona Food and Agriculture Policy Advisory Council**

Established by the Director of the Arizona Department of Agriculture, the Arizona Food and Agriculture Policy Advisory Council is a 13-member committee appointed with the goal to design and implement a five-year roadmap for improving the overall health of the state. Geographically representative of Arizona’s counties, members of the Advisory Council include state government officials, emergency food providers, agricultural producers, and food security advocates. A preliminary five-year roadmap has been published by the Advisory Council as follows:

1. **Bolstering Arizona’s emergency food network:**
   a. Leverage public-private funding to improve the supply, processing, and distribution (food hubs) from Arizona-based producers to supplemental food providers.
   b. The food hubs will support community-based food economies by decentralizing and customizing regionally to better serve rural communities, and connect economic and job opportunities.
   c. Increase access to nutrition education and food literacy to empower healthy food and economic choices that maximizes household budgets.
   d. Improve child nutrition by increasing local and nutritious food access at community-driven locations serving families.
2. **Creating an equitable food system:**
   a. Improve and promote educational attainment at all levels including teaching skills in gardening, empowering people to grow their own food, and attracting youth to farming and agriculture-related business.
b. Bring together all agriculture to collect and disseminate to all farmers and co-ops the best business practices and models including and maximizing production, efficiency, and minimizing waste using technology and improved communications like a central resource.

c. From an equity perspective and with a culturally sensitive frame, raise awareness and community engagement on all aspects of the food system and the roots causes of food inequities.

3. Establishing long-term food security solutions through economic development:
   a. Integrate all agriculture into one statewide, community-based food economy to create sustainable economic development.
   b. Create, support, and promote Arizona Grown and local-food economies by encouraging local spending and non-profit grocery/co-op models.
   c. Provide and support technical assistance for agriculture-related businesses for access to capital resources and start-up operations.

For more information about the Arizona Food and Agriculture Policy Advisory Council, please contact the Arizona Department of Agriculture at (602) 542-4373.

Educational Handbooks, Courses, & Organizations

College of Agriculture and Life Sciences & College of Nutritional Sciences
Cooperative Extension, University of Arizona

Citrus Management
(928) 782-5876

The Arizona Cooperative Extension Citrus Management program provides information on how to care for citrus plants in a desert climate, as well as protect citrus fruits from diseases specific to Arizona. Through ongoing research, the Citrus Management program regularly publishes best care practices on its website for local residents to use.

For downloadable resources from the Citrus Management program, please visit their website at extension.arizona.edu/citrus-management.

Pima County Master Gardeners Program
4210 N. Campbell Ave., Tucson, AZ 85719
(520) 626-5161

The Pima County Master Gardeners are local volunteers who serve Southern Arizona as garden and landscape educators. Following the completion of a formal certification program, Master Gardeners are available to the public to provide gardening assistance and advice. Additionally, the Master Gardener
program has several gardening and landscape publications for Arizona gardeners to refer to on its website.

To contact your local Master Gardener, please visit [extension.arizona.edu/pima-master-gardeners](http://extension.arizona.edu/pima-master-gardeners).

**The Garden Kitchen**
2205 S. 4th Ave., Tucson, AZ 85713
(520) 621-0476

Helping families adopt healthy lifestyles, the Garden Kitchen is a free nutrition education program that is available to all community members. Through monthly gardening, cooking, and physical activity classes, the Garden Kitchen teaches families how to incorporate fresh, nutritious foods into their diet. Recipes and gardening resources are available on the Garden Kitchen’s website.

For more information about the Garden Kitchen, please visit [thegardenkitchen.org](http://thegardenkitchen.org).

**Community Food Bank of Southern Arizona**
3003 S. Country Club Rd., Tucson, AZ 85713
(520) 622-0525

**Abundant Harvest Cooperative**

The Community Food Bank’s Abundant Harvest Cooperative is a local membership program for small-scale farmers and backyard gardeners. By integrating opportunities to learn, network, and sell organic products, members of the cooperative gain the necessary skills and resources for participating in Tucson’s local food economy. Available to cooperative members is a shared market table where products can be sold weekly at Community Food Bank Farmers’ Markets.

To become a member of the cooperative, please visit their website at [communityfoodbank.org/Our-Work/Programs/Abundant-Harvest-Cooperative](http://communityfoodbank.org/Our-Work/Programs/Abundant-Harvest-Cooperative).

**Garden Leaders Program**

In the commitment to build an equitable food system in Tucson, the Community Food Bank of Southern Arizona has developed the Garden Leaders program to empower future food justice leaders. Through the program, community leaders earn a certificate that spans across eleven thematic areas in sustainable desert gardening. Furthermore, Garden Leaders cultivate a local network that will ensure continued support for projects pursued following the completion of the program.

To learn more about the Garden Leaders program, please visit their website at [communityfoodbank.org/Our-Work/Programs/Garden-Leaders](http://communityfoodbank.org/Our-Work/Programs/Garden-Leaders).
Las Milpitas de Cottonwood Community Farm
2405 S. Cottonwood Ln., Tucson, AZ 85713

Run by the Community Food Bank of Southern Arizona, Las Milpitas de Cottonwood is a six-acre community farm that serves as an educational cornerstone for Tucson gardeners. At no cost, Las Milpitas de Cottonwood offers local residents the materials and support necessary for growing their own food, thereby making fresh produce more accessible to the wider community. In addition, Las Milpitas provides seasonal workshops for gardeners to learn essential and advanced skills in organic desert food production.

To contact Las Milpitas de Cottonwood, please visit communityfoodbank.org/Locations/Las-Milpitas.

Nuestra Tierra Learning Garden

Nuestra Tierra Learning Garden is a demonstration garden located at the Community Food Bank's headquarters in Tucson. Open to the public, the garden serves as an educational setting to teach sustainable gardening practices in a semi-arid climate. Visitors of Nuestra Tierra will find vegetable and herb gardens, a greenhouse, and a chicken coop, as well as composting and rainwater harvesting systems.

For more information about the Nuestra Tierra Learning Garden, please visit their website at communityfoodbank.org/Our-Work/Programs/Nuestra-Tierra.

Community Gardens of Tucson
2940 N. Santa Rosa Pl., Tucson, AZ 85712
(520) 795-8823

Community Gardens of Tucson is a nonprofit organization that cultivates community well-being through gardening. With a wide range of educational and material resources available, gardeners of all backgrounds and experiences are able to participate across the 26 community gardens CGT supports.

To find the community garden nearest you, please visit their website at communitygardensoftucson.org.

Compass Affordable Housing’s Alvord Court Community Garden
5901 S. Park Ave., Tucson, AZ 85706
(520) 777-3766

Managed by the nonprofit organization Compass Affordable Housing, Alvord Court is an apartment complex that provides housing for low-income, disabled women, men, and families in South Tucson. To improve the accessibility of fresh, nutritious food in the neighborhood, Alvord Court opened a community garden in 2016. The community garden features raised gardening beds, fruit trees, and a rainwater harvesting system.
Desert Harvesters
P.O. Box 92, Tucson, AZ 85702

Inspired by the biodiversity of the Sonoran Desert, Desert Harvesters promotes the planting, harvesting, and processing of indigenous, edible plants. Each year, Desert Harvesters organizes a mesquite milling festival that highlights the symbiotic relationship between the people of Tucson and the desert ecosystem. Additionally, Desert Harvesters offers demonstration workshops and guided harvests that teach Tucson residents how to cultivate, harvest, and cook food-bearing plants native to the Southwest.

For more information about Desert Harvesters, please visit their website at desertharvesters.org.

Feeding Tucson

Energized by the local food movement, Feeding Tucson is a grassroots collective that fosters community well-being and environmental sustainability through projects that strengthen Tucson’s food system. At its core is the Food Resilience Project, an initiative designed to assist communities in developing neighborhood-based activities that build local food networks and social cohesion.

For more information about Feeding Tucson, please visit their website at http://feedingtucson.org.

Flowers & Bullets
(520) 261-7355

Founded in 2012, Flowers and Bullets is a collective that encourages individual and community healing through sustainable living and artistic expression. Through its mission of empowerment, Flowers and Bullets works alongside community members to create backyard gardens, build rainwater harvesting systems, and sell local food products. In 2016, Flowers and Bullets was granted a lease to revitalize a vacant school property into a community garden space that will promote cultural heritage, environmental sustainability, and community resilience.

Additional information about Flowers and Bullets can be found at flowersandbullets.com.

Friends of Tucson’s Birthplace’s Mission Garden
946 W. Mission Ln., Tucson, AZ 85745

Symbolic of Tucson’s agricultural roots, Mission Garden is a restored Spanish colonial garden from the historic San Agustin Mission. Located at the base of Sentinel Peak, the garden features heirloom fruit trees and vegetable crops that represent each settlement period spanning across Tucson’s 4000 years of agricultural history. Embraced as cultural landmark throughout Tucson, Mission Garden is open to visitors on Saturdays.

For more information about Mission Garden, please visit tucsonsbirthplace.org.
International Rescue Committee’s New Roots Program
2100 N. Kolb Rd. Suite 103, Tucson, AZ 85715
(520) 319-2128

Enabling greater integration into their new communities, the International Rescue Committee’s New Roots program provides refugee families with the space, materials and training to participate in urban gardening activities throughout Tucson. Whether through backyard or community gardening, the New Roots program allows refugees to cultivate fresh, nutritious food while connecting with their neighbors. Advanced gardeners of the program can complete a certificate course offered through the International Rescue Committee’s MicroProducer Academy, which teaches refugees how to grow and sell produce for market.

For more information about the International Rescue Committee’s Tucson office, please visit rescue.org/united-states/tucson-az.

Native Seeds/SEARCH
3061 N. Campbell Ave., Tucson, AZ 85719
(520) 622-5561

Recognized globally for its work, Native Seeds/SEARCH is a nonprofit seed conservation organization in Tucson, Arizona. In alignment with its mission to conserve and share desert-adapted heirloom and landrace seeds, Native Seeds/SEARCH has established several resources and programs that protect crop diversity, preserve cultural heritage, and promote food security in the Greater Southwest. To engage the community in its mission, Native Seeds/SEARCH hosts educational workshops and events that teach local residents how to cultivate, save, and share seeds.

For a list of upcoming workshops and events, please visit nativeseeds.org.

Southwest Victory Gardens
1606 W Saint Clair St, Tucson, AZ 85745
(520) 576-7085

Committed to promoting self-sufficiency, Southwest Victory Gardens is transforming the way local Tucsonans envision and utilize their backyard space. Through one-on-one sessions, Southwest Victory Gardens teaches its clients how to grow fresh, nutritious foods while building customized backyard gardens. Additionally, Southwest Victory Gardens offers private workshops for large groups and organizations, as well as free classes that are available to the public.

Dates of upcoming classes and additional information can be found at southwestvictorygardens.com.

Sonoran Permaculture Guild
Through workshops, classes, and a certificate program, the Sonoran Permaculture Guild provides educational training to individuals interested in learning about permaculture, a practice of sustainable landscape design that is reflective of the natural ecosystem. Every fall and spring, the Sonoran Permaculture Guild administers a five-week permaculture certificate course that emphasizes hands-on training. The Sonoran Permaculture Guild also offers consultative services for assessing, designing, and implementing permaculture projects in the region.

For additional information about the Sonoran Permaculture Guild, please visit their website at sonoranpermaculture.org.

**Tierra y Libertad Organization**

A community-based organization, Tierra y Libertad is leading the movement for social change in South Tucson. By connecting dimensions of social justice with environmental sustainability, Tierra y Libertad has developed urban greening and food production projects that build community resilience in the barrios of Tucson. Its programs include the Barrio Sustainability Project, TYLO Freedom School, MAIZ, and the Migrants Rights Organizing Campaign.

To contact Tierra y Libertad, please visit [facebook.com/TierraY LibertadOrganization/](http://facebook.com/TierraYLibertadOrganization/).

**Tucson Organic Gardeners**

PO Box 41703, Tucson, AZ 85717

Tucson Organic Gardeners is a membership-based group that is dedicated to providing educational opportunities and resources to local residents interested in sustainable gardening and composting practices. Tucson Organic Gardeners organizes a monthly speaker series, as well as a seasonal Organic Garden Fair that is free and open to the public.

For more information about Tucson Organic Gardeners, please visit [tucsonorganicgardeners.org](http://tucsonorganicgardeners.org).

**Tucson Backyard Gardening**

A public Facebook forum, ‘Tucson Backyard Gardening’ provides a virtual space for the people of Tucson to connect and share their experiences of gardening in a desert climate. From posts forwarding dates of local planting sales to posts requesting soil amendment recommendations, ‘Tucson Backyard Gardening’ provides a local network for Tucson’s gardeners.

The group can be found online at [https://www.facebook.com/groups/123250067720449/](https://www.facebook.com/groups/123250067720449/).

**Vitalyst Health Foundation**

2929 N. Central Ave., Suite 1550, Phoenix, AZ 85012
(602) 385-6500
Unlocking human potential by promoting and advancing efforts to build healthy communities, Vitalyst Health Foundation is a public organization that serves individuals and communities throughout Arizona. In the commitment to improve health outcomes across the state, Vitalyst Health Foundation has created a workbook series that highlights collaborative health initiatives communities can implement, such as community gardening. The workbooks can be accessed and downloaded at the following links:

**Creating Resilient Communities: A how-to resource guide for cultivating resiliency in local communities**, vitalysthealth.org/workbook-creating-resilient-communities/


**Urban Farming: An introduction to urban farming, from types and benefits to strategies and regulations**, vitalysthealth.org/workbook-urban-farming/

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**Planting Supplies & Services**

**Community Food Bank of Southern Arizona**  
3003 S. Country Club Rd., Tucson, AZ 85713  
(520) 622-0525

To engage all community members in the mission to create a healthy, sustainable food system in Tucson, the Community Food Bank of Southern Arizona offers free and low-cost gardening and water harvesting education, supplies, and services to low-income households. Organizations that support underserved communities are also eligible to receive materials and services from the Food Bank.

For a comprehensive list of services available as well as eligibility requirements, please visit communityfoodbank.org/Our-Work/Programs/Garden-Installation.

**Desert Survivors Native Plant Nursery**  
1020 W. Starr Pass Blvd, Tucson, AZ 85713  
(520) 791-9309

Desert Survivors is a nonprofit organization that supports the local Tucson community by integrating environmental sustainability with human health and wellbeing. Plants available at the nursery are locally adapted, low-water use species that are native to the southeastern region of Arizona. Alongside its collection of native plants, Desert Survivors offers employment opportunities for adults with developmental disabilities as a means of providing horticulture therapy.
Business hours and additional information can be found at [desertsurvivors.org](http://desertsurvivors.org).

**EcoGro**  
657 W. Saint Mary's Rd., Tucson, AZ 85701  
(520) 777-8307

An aquaponics supply store and exotic plant nursery, EcoGro was established out of the owner’s commitment to sustainable gardening. Through the provision of aquaponics supplies, EcoGro is catalyzing a new approach to the local food movement in Tucson. EcoGro’s selection of exotic plants also serves as a distinguishing feature of this local business.

Business hours and additional information can be found at [ecogro.com](http://ecogro.com).

**Green Things**  
3384 E. River Rd., Tucson, AZ 85718  
(520) 299-9471

Providing a wide range of gardening products and services, Green Things is a local nursery that is a favorite among Tucson gardeners. Covering all of your gardening needs, Green Things sells seeds, seedlings, fertilizers, compost, mulch, shade and frost cloth, hand tools, and more. Additionally, Green Things provides related services in product delivery, planting, landscape design, irrigation maintenance, and plant rental.

Business hours and additional information can be found at [greenthingsaz.com](http://greenthingsaz.com).

**Harlow Gardens**  
5620 E. Pima St., Tucson, AZ  
(520) 298-3303

For seventy years, Harlow Gardens has served the Southwest through its provision of high-quality gardening and landscaping services. At its Garden Center, experts known as “Garden Wizards” are available to answer any questions a customer may have.

Business hours and additional information can be found at [harlowgardens.com](http://harlowgardens.com/).

**Mesquite Valley Growers Nursery**  
8005 E. Speedway Blvd, Tucson, AZ 85710  
(520) 721-8600

Offering a diverse collection of trees and plants, Mesquite Valley Growers Nursery is a local business known for having the largest selection of plants in Tucson. Combined with their extensive gardening and landscaping knowledge, Mesquite Valley ensures that its customers are able to find plants that fulfill their gardening and landscaping needs.
Recognized globally for its work, Native Seeds/SEARCH (NS/S) is a nonprofit seed conservation organization in Tucson, Arizona. In alignment with its mission to conserve and share desert-adapted heirloom and landrace seeds, NS/S has established several resources and programs that protect crop diversity, preserve cultural heritage, and promote food security in the Greater Southwest:

1. **Native American Free Seed Program**: At no charge, NS/S offers seeds from its seed bank collection to Native Americans living in the Greater Southwest region.
2. **Native American Bulk Seed Exchange Program**: Available to Native American farmers and organizations serving indigenous populations, NS/S supplies bulk quantities of seeds suited for the farm-scale growing of traditional crops.
3. **Community Seed Grants**: Through its grant program, NS/S donates seeds to organizations promoting education, food security, and community development in underserved neighborhoods.
4. **Seed Library**: Located in its retail store, the NS/S Seed Library is a free community seed saving and sharing initiative that promotes the use of arid-adapted plant varieties.
5. **Online Store**: Through its website, NS/S sells landrace and heirloom seeds from its Seed Bank collection, as well as non-collection heirloom seed varieties adaptable to the arid climate of the Southwest.
6. **Retail Store**: At its retail location, NS/S sells heirloom seeds and locally produced Southwestern foods.

Business hours and additional information about Native Seeds/SEARCH can be found at nativeseeds.org.

**Pima County Public Library’s Seed Library**

101 N. Stone Ave., Tucson, AZ 85701
(520) 791-4010

In the effort to preserve Tucson’s rich agricultural history, the Pima County Public Library created the Seed Library, a community-sustained seed saving and sharing program. Accessible to residents at public library locations throughout Tucson, gardeners can use their library card to “check out” 10 seed packets each month with the option to donate seeds to the library’s collection following their harvest. The Seed Library collection includes heirloom and open-pollinated plant varieties, and can be viewed online using the library’s seed catalog.
To view the seed catalog or to find the nearest Seed Library, please visit library.pima.gov/browse_program/seed-library/.

Southwest Victory Gardens
1606 W. Saint Clair St., Tucson, AZ 85745
(520) 576-7085

Committed to promoting self-sufficiency, Southwest Victory Gardens is transforming the way local Tucsonans envision and utilize their backyard space. Through one-on-one sessions, Southwest Victory Gardens teaches its clients how to grow fresh, nutritious foods while building customized backyard gardens. Additionally, Southwest Victory Gardens specializes in home composting systems, chicken coop installations, and fruit tree maintenance.

Pricing and additional information can be found at southwestvictorygardens.com.

Tank’s Green Stuff
(Main Office) 1360 N. Kolb Rd., Tucson, AZ 85715
(520) 290-2796

Often cited as having the best compost in Tucson, Tank’s Green Stuff is a local business that produces and sells 100% organic composting soil. Made from recycled tree trimmings, organic manure, elemental sulfur, and microbes, Tank’s compost is OMRI Certified and ASCO Verified for organic growing. Mulch, bedding, and potting soil products can also be found at Tank’s.

Business hours and additional information can be found at tanksgreenstuff.com.

Donating & Selling Produce

Community Food Bank of Southern Arizona
3003 S. Country Club Rd., Tucson, AZ 85713
(520) 622-0525

Abundant Harvest Cooperative

The Community Food Bank’s Abundant Harvest Cooperative is a local membership program for small-scale farmers and backyard gardeners. By integrating opportunities to learn, network, and sell organic products, members of the cooperative gain the necessary skills and resources for participating in Tucson’s local food economy. Available to cooperative members is a shared market table where products can be sold weekly at Community Food Bank Farmers’ Markets.

To become a member of the cooperative, please visit their website at communityfoodbank.org/Our-Work/Programs/Abundant-Harvest-Cooperative.
Fresh Fruit for All
The Community Food Bank of Southern Arizona accepts citrus donations as well as offers gleaning services through its Fresh Fruit for All program. All citrus donations are distributed to individuals and families in need of emergency food assistance. Donations of picked citrus fruit can be dropped off at the following locations in Pima County:

   Monday – Friday: 8am-4pm
2. Community Food Bank in Marana (11734 W. Grier Rd., Marana, AZ 85653)
   Monday, Tuesday, Thursday, Friday: 9am-3pm
   Wednesday: 9am-5pm
3. Community Food Bank in Green Valley (250 Continental Rd. #101, Green Valley, AZ 85614)
   Monday – Friday: 7:30am-2pm

Additionally, the Community Food Bank of Southern Arizona offers gleaning services to local homeowners during the citrus season (January-March). To assist in covering gleaning costs, the food bank requests that a $20 donation be made for each two-hour appointment.

For more information about the Fresh Fruit for All program, please visit their website at communityfoodbank.org/Our-Work/Programs/Gleaning.

Iskashitaa Refugee Network
1406 E. Grant Rd., Bldg. 2, Tucson, AZ 85719
(520) 440-0100

The Iskashitaa Refugee Network is an award-winning nonprofit organization that helps refugees rebuild their lives in Southern Arizona. The Network provides refugees with educational and professional opportunities to participate in urban food production activities throughout Tucson. Specifically, refugees develop essential leadership, language, and entrepreneurial skills by harvesting, gleaning and processing locally grown produce.

For households interested in Iskashitaa’s year-round harvesting and gleaning services, local residents can either fill out an online form (www.iskashitaa.org/donate-your-fruit) or call (520) 440-0100 to set up an appointment. It is also requested that a $25 donation is made to cover harvesting costs.

Additional information about the Iskashitaa Refugee Network can be found at www.iskashitaa.org.
Farmers’ Markets

Community Food Bank of Southern Arizona Farmers’ Markets
Integrating food security with community development, the Community Food Bank of Southern Arizona currently operates two farmers’ markets. Each of these farmers’ markets are located in food desert regions thereby improving the accessibility of fresh, nutritious foods to the surrounding communities. The Community Food Bank’s farmers’ markets are located at:

1. Santa Cruz River Farmers Market (Congress and Grande, 100 S. Avenida del Convento)
2. Community Food Bank Farm Stand (36th & Country Club, 3003 S. Country Club Rd.)

The Community Food Bank of Southern Arizona accepts EBT cards, as well as WIC and Farmers’ Market Nutrition Program checks at both of its farmers’ market locations. Additionally, community members can receive up to a $20 match for every dollar they spend using their EBT card through the Double-Up SNAP program.

Updated hours and maps can be found online at communityfoodbank.org/Our-Work/Programs/Farmers-Markets/Markets.

FoodInRoot Farmers’ Markets
Committed to making fresh, nutritious food accessible to all communities, FoodInRoot utilizes technology to transform the farmers’ market experience. By emphasizing the use of technology, FoodInRoot is able to effectively support local food businesses, as well as make the farmers’ market experience more convenient for community members. One of their initiatives includes a FarmFan app that directly sends subscribers a list of foods that will be available for purchase the day of the farmers’ market.

Currently, there are seven FoodInRoot farmers’ markets across Southern Arizona:

1. Green Valley Farmers and Artisans Market (1111 S. GVR Dr., Green Valley, AZ 85614)
2. UA Main Campus Farmers Market (1303 E. University Blvd, Tucson, AZ 85719)
3. Banner – UMC Farmers Market (1501 N. Campbell Ave., Tucson, AZ 85724)
4. Rancho Sahuarita Twilight Market (15455 S. Camino Lago Azul, Sahuarita, AZ 85629)
5. Tucson Botanical Gardens Twilight Market (2150 N. Alvernon Way, Tucson, AZ 85712)
6. St. Philip’s Artisan Farmers’ Market (4280 N. Campbell Ave., Tucson, AZ 85718)
7. St. Philip’s Classic Farmers’ Market (4280 N. Campbell Ave., Tucson, AZ 85718)

FoodInRoot accepts EBT cards at its St. Philip’s Farmers’ Market location.

For a complete list of the dates and times for each FoodInRoot farmers’ market location, please visit their website at foodinroot.com or call at (520) 261-6982.
**Heirloom Farmers Markets**

Heirloom Farmers Markets is a non-profit organization dedicated to building and sustaining a local food economy in Southern Arizona. Currently, they operate four farmers’ market locations:

1. **Rillito Park Farmers Market** (Food Pavilion, 4502 N. 1st Ave., Tucson, AZ 85719)
2. **Trail Dust Town Farmers Market** (Trail Dust Town, 6541 E. Tanque Verde Rd., Tucson, AZ 85715)
3. **Oro Valley Farmers Market** (Steam Pump Ranch, 10901 N. Oracle Rd., Oro Valley, AZ 85737)
4. **Green Valley Farmers & Artisans Market** (Green Valley Village, 101 S. La Canada Dr., Green Valley, AZ 85614)

Heirloom Farmers Markets accepts WIC checks and Arizona Farmers’ Market Nutrition Program checks at all of its locations. Additionally, EBT cards are accepted at its Friday Trail Dust Town and Sunday Rillito Park Farmers Markets. At both of these locations, community members can receive up to a $20 match for every dollar they spend using their EBT/SNAP card through the Double-Up SNAP program.

For more information about Heirloom Farmers Markets, please visit their website at heirloomfm.org or call at (520) 882-2157.

**Government Food & Nutrition Assistance Programs**

**The Emergency Food Assistance Program**

The Emergency Food Assistance Program (TEFAP) is a federal program designed to provide low-income individuals and families emergency food assistance at no cost. Individuals and families can receive an emergency food box at a local food pantry.

Upon arrival at the food pantry, individuals will be asked to sign in certifying that the total gross income of the household does not exceed 185% of the federal poverty level. Additionally, individuals will be asked to provide the following documents at the food pantry:

- Photo identification (driver’s license, work ID, school ID or other document with a name and picture).
- Proof of address (utility bill, DES letter, or other document verifying current residential address). For Arizona residents living in a rural area, a P.O. Box is accepted. For Arizona residents that are homeless, cross-streets and/or location of where staying at night is accepted.

As stated by the Department of Economic Security, if an individual is already receiving Nutrition Assistance benefits through the state, they are automatically eligible to receive emergency food assistance.

Once an individual has signed in, they will receive a 3-5 day supply of food to take home. Furthermore, they are eligible to receive a prepared meal at a hot meal site.
To find the nearest food pantry and/or hot meal site, please call the Coordinated Hunger Relief Program at (602) 771-2788 or the Association of Arizona Food Banks at 1-800-445-1914.

**Supplemental Nutrition Assistance Program**

The Supplemental Nutrition Assistance Program (SNAP) is the federal government’s largest food and nutrition assistance program. Through SNAP, low-income individuals and households receive monthly benefits on an electronic benefit transfer card (EBT). This allows them to purchase food at authorized grocery stores and farmers’ markets, as well as seeds and plants for household consumption. Eligibility for the program is determined by a number of factors including household resources, income, deductions, employment, disability, age, and immigration status.

Arizona residents can determine if they qualify for nutrition assistance and other service benefits by using a free and confidential pre-screening tool that is available at [www.ArizonaSelfHelp.org](http://www.ArizonaSelfHelp.org).

To apply for SNAP benefits, Arizona residents can fill out an online application at the Health-e-Arizona Plus website ([www.healthearizonaplus.gov](http://www.healthearizonaplus.gov)). Filling out the Health-e-Arizona Plus application will also determine if you are eligible to receive other forms of state benefits including medical coverage and cash assistance.

For additional information on SNAP, please call the State SNAP hotline number at 1-800-352-8401 or the Arizona Department of Economic Security’s Nutrition Assistance program at (855) 432-7587.

**Double-Up SNAP**

Through the Double-Up SNAP program, community members can use their SNAP benefits to purchase fresh fruits and vegetables at participating farmers’ markets in Tucson. Additionally, when SNAP participants use their EBT card, they can receive up to a $20 match for every dollar they spend. Local farmers’ markets that participate in the Double-Up SNAP program include:

1. [Santa Cruz River Farmers Market](#) (Congress and Grande, 100 S. Avenida del Convento)
2. [Community Food Bank Farm Stand](#) (36th & Country Club, 3003 S. Country Club Rd.)
3. [Rillito Park Farmers Market](#) (Food Pavilion, 4502 N. 1st Ave., Tucson, AZ 85719)
4. [Trail Dust Town Farmers Market](#) (Trail Dust Town, 6541 E. Tanque Verde Rd., Tucson, AZ 85715)

**Special Supplemental Nutrition Program for Women, Infants, and Children**

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a federally funded program that provides nutritional food and services to low-income pregnant, breastfeeding, and postpartum women, and to infants and children under the age of five. WIC program benefits include nutrition education, supplemental food packages, and healthcare referrals.

Arizona residents can determine if they qualify for nutrition assistance and other service benefits by using a free and confidential pre-screening tool that is available at [www.ArizonaSelfHelp.org](http://www.ArizonaSelfHelp.org).
To apply for WIC benefits, Arizona residents can schedule an appointment at the nearest WIC clinic. To find the nearest WIC clinic, please call 1-800-252-5942.

For additional information about WIC, please call the Arizona Department of Health Services at 1-800-252-5942.

**WIC Cash Value Voucher**

Through WIC, families can use their monthly Cash Value Vouchers (CVV) to buy fresh fruits and vegetables at approved farmers’ markets. Local farmers’ markets that accept WIC checks include:

1. [Santa Cruz River Farmers Market](https://www.santarucriverfarmersmarket.com) (Congress and Grande, 100 S. Avenida del Convento)
2. [Community Food Bank Farm Stand](https://communityfoodbankfarmstand.com) (36th & Country Club, 3003 S. Country Club Rd.)
3. [Rillito Park Farmers Market](https://rillitoparkfarmersmarket.com) (Food Pavilion, 4502 N. 1st Ave., Tucson, AZ 85719)
4. [Trail Dust Town Farmers Market](https://traildusttownfarmersmarket.com) (Trail Dust Town, 6541 E. Tanque Verde Rd., Tucson, AZ 85715)
5. [Oro Valley Farmers Market](https://orovalleyfarmersmarket.com) (Steam Pump Ranch, 10901 N. Oracle Rd., Oro Valley, AZ 85737)
6. [Green Valley Farmers & Artisans Market](https://greenvalleyfarmersmarkets.com) (Green Valley Village, 101 S. La Canada Dr., Green Valley, AZ 85614)

**Commodity Supplemental Food Program**

The Commodity Supplemental Food Program (CSFP) is a federally funded food and nutrition assistance program for low-income residents that are 60 years of age or older. Administered through the Arizona Department of Health Services, program participants receive a supplemental food package once a month, as well as nutrition information.

To apply for CSFP, Arizona residents can schedule an appointment at the nearest CSFP agency. To find the nearest CSFP agency, please call 1-800-252-5942.

For additional information about CSFP, please call the Arizona Department of Health Services at 1-800-252-5942.

**WIC & CSFP Arizona Farmers’ Market Nutrition Program**

Administered through the Arizona Department of Health Services, the Arizona Farmers’ Market Nutrition Program (AzFMNP) is available to WIC and CSFP participants. Individuals and families participating in these programs will receive checks totaling $30 per year to purchase fresh fruits and vegetables at approved farmers’ markets. Local farmers’ markets that accept AzFMNP checks include:

1. [Santa Cruz River Farmers Market](https://www.santarucriverfarmersmarket.com) (Congress and Grande, 100 S. Avenida del Convento)
2. [Community Food Bank Farm Stand](https://communityfoodbankfarmstand.com) (36th & Country Club, 3003 S. Country Club Rd.)
3. [Rillito Park Farmers Market](https://rillitoparkfarmersmarket.com) (Food Pavilion, 4502 N. 1st Ave., Tucson, AZ 85719)
4. [Trail Dust Town Farmers Market](https://traildusttownfarmersmarket.com) (Trail Dust Town, 6541 E. Tanque Verde Rd., Tucson, AZ 85715)
5. [Oro Valley Farmers Market](https://orovalleyfarmersmarket.com) (Steam Pump Ranch, 10901 N. Oracle Rd., Oro Valley, AZ 85737)
6. **Green Valley Farmers & Artisans Market** (Green Valley Village, 101 S. La Canada Dr., Green Valley, AZ 85614)

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**Appendix**

**Building a Vegetable Garden**
Ten Steps to a Successful Vegetable Garden, University of Arizona College of Agriculture and Life Sciences Cooperative Extension

**Composting Basics**
Home Composting in the Desert: Putting Life Back into the Earth, Tucson Organic Gardeners

**Irrigation Maintenance**
Irrigation Repair Guide, Community Gardens of Tucson

**Drip Irrigation: The Basics**, University of Arizona College of Agriculture and Life Sciences Cooperative Extension

**Planting Calendars**
Planting Guide, Community Food Bank of Southern Arizona

Community Gardens of Tucson Planting Guide, Community Gardens of Tucson

Low Desert Planting Guide and Calendar, Native Seeds/SEARCH

Mediterranean Gardening in Tucson, Southwest Victory Gardens

Summer Gardening, Southwest Victory Gardens

Winter Gardening, Southwest Victory Gardens


Companion Plants Chart, University of Arizona Community and School Garden Program

**Passive Rainwater Harvesting**
Passive Water Harvesting: Rainwater Collection, University of Arizona College of Agriculture and Life Sciences Cooperative Extension

**Seed Buying**
Seed Watch: A Seed Buyer’s Guide, Native Seeds/SEARCH
Ten Steps to a Successful Vegetable Garden

Gardening with vegetables can be fun and can provide delicious and highly nutritious fresh food. Watching and working with plants can add a new dimension of enjoyment to life. Bring an awareness of the wonderful world of nature in the backyard. The marvels of nature will have special personal meaning when nurturing a small seed into a colorful productive plant with your own hands. These accomplishments can be obtained regardless of the size of garden. A few plants or a large plot will give rewarding experiences for both young and old. The path to a successful vegetable garden is not difficult or long. Ten carefully taken steps will produce many enjoyable moments and an abundant harvest of fresh vegetables during much of the year.

Step 1
Select a good location

Choose an area with plenty of morning sunlight and some afternoon shade. Most vegetables, especially fruiting types, do best with six to eight hours of full sun exposure. Leafy and root vegetables will tolerate partial shade. Don’t plant gardens under or near trees or large shrubs—their roots will rob fertility and water from vegetables. Don’t plant vegetables in the narrow shaded space between houses and walls.

A loose, fertile, level, well-drained soil is best. If possible, avoid heavy clays and very sandy soils. If caliche is present it must be dug out and removed. Avoid areas that are crusted with alkali salts or infested with hard to control weeds such as Bermudagrass, nutgrass, Johnson grass or bindweed.

A synthetic soil, self prepared or purchased, can be used in raised beds or containers (pots, tubs, boxes) if good soil is not available. Where space is limited, container gardening can be practiced. A convenient water supply for irrigating is necessary.

Microclimates occur throughout the property. Depending upon your elevation select spots on the property that are best suited to warm or cool season vegetables.

Step 2
Plan your garden layout

Planning ahead will help avoid problems and make your garden a complement to your landscape. First, sketch a plan of the intended planting area for vegetables. Write down the size of the area or location of containers. This is the beginning of a gardening notebook or journal. A gardening journal will help when making decisions for your garden in subsequent years.

Mark on the plan where the vegetables will be planted, making sure to leave room for growing space between plants. Also, list the planting date for each vegetable. Arrange plantings according to harvest periods and growth characteristics. Plant vegetables adjacent to each other which will be harvested about the same time. Avoid having taller plants shade younger and smaller vegetables.

Refer to table 10.9 in the Arizona Master Gardener Manual for the number of plants needed for each vegetable per person in the household.
Step 3  Grow recommended varieties

Gardening success can be greatly influenced by the varieties you use. Select from recommended lists and from those known to do well locally. It is a good idea to try one or two new varieties each year. Plant them next to old favorites for comparison. Keep a notebook or journal from year to year to note what varieties perform best. For mini-gardens try bush or dwarf varieties.

Some vegetables are colorful, use them in areas traditionally planted with ornamentals.

Seed catalogues will be a big help in finding these. Look for All-American Selection Award winners. (www.all-americanselections.org)

Step 4  Obtain good seed, plants, equipment and supplies

Before planting, find a reputable source for seed and other garden supplies. Seed catalogs can be helpful, but be sure the varieties are locally adapted. Buy new seed since some seeds over a year old will not germinate (sprout) well. Some seeds can be saved and are best placed in jars or in plastic bags and stored in a freezer. Due the hybridization, seed saved from hybrid vegetables will not produce plants like the parent.

Vegetable transplants can be purchased at garden stores, nurseries and greenhouses. Insist on recommended varieties. Select plants that are healthy, stocky, medium-sized, with vigorous roots and that are pest free. Avoid plants that have insects or are wilted, yellow, spindly, too large or have spots on the leaves, brown lesions on the stems or knots/galls on the roots. Obtain plants in containers (pots, 6 or 8 packs, bands or boxes) when possible so that the root systems are intact. Transplants should not be disturbed any more than necessary and “hardened-off.” Transplants can be started if desired.

Have all equipment and tools clean and in good condition before working the soil. A hoe, spade, garden rake, trowel, measuring stick and planting line are essential. A hand cultivator and seed drill reduce work in larger gardens. Hoses, sprinklers and drip lines are convenient for watering. Other needed supplies are fertilizers and mulching materials.

Study pest control recommendations to determine what may be needed after positively identifying the pest. It is important to have a quick source of materials for pest control if needed. A good sprayer or duster to control garden pests should be available for use. Care should be taken in handling, applying and storing all chemicals. Always follow the pesticide label instructions, it is a legal document!

Step 5  Prepare and care for the soil properly

Soil provides nutrients and water for plants. If limited or if the soil is compact or hard and crusty when dry, and water-soaked and sticky when wet, plants will not grow and develop properly. To maintain and improve soil conditions, mix organic matter and fertilizers into the soil before planting, and prepare and cultivate the soil when dry or slightly moist (never when wet).

Organic matter makes the soil loose (friable) and easy to work and improves nutrient and water-holding capacity, drainage and aeration. Well rotted manure, compost, and leaf mulch are commonly used organic materials. Composted manure is easy to use and is relatively free of weed seeds. Apply a layer of organic matter 2 to 3 inches thick on the garden area about 1 to 2 months before planting. Work it into the top 10-12 inches of soil. A thorough watering of soil at this time helps leach harmful salts from the root zone. If poultry manures are used apply them at half rate.

A fertilizer should be added containing both nitrogen and phosphorus and be applied before planting. These nutrients will benefit most garden crops. Although soils vary in fertility, a typical fertilizer application would be 1 to 2 lbs. (1 to 2 cups) of 16-20-0 (ammonium phosphate) per 100 ft.² spread evenly over the soil. Also, 3 to 5 lb. of soil sulfur/100 ft.² may be added if water drainage is poor. All these materials should be plowed, roto-tilled or spaded into the top 10 to 12 inches of soil shortly before planting.

In preparing the seedbed, do not work the soil when it is too wet. Wait for it to dry sufficiently so it crumbles in your hands. Level the area by raking. Then make raised beds if using furrow irrigation (See Figure A). Top dress planted area with a three inch layer of organic mulch after seedlings emerge or after transplanting (See Step 8). Organic mulch will cool the soil which can retard growth at the higher elevations in Arizona.

When growing vegetables in close quarters or where good soil is not available, an artificial soil can be used. If the soil doesn’t drain well consider using raised beds filled with ½ garden soil and ½ artificial soil mix, coarse sand, perlite or vermiculite. (see Figure B).

During the growing season fertilizers may be needed. Applying bands of fertilizer, usually only nitrogen, is called “side-dressing.” Apply ½ lb./100 feet of row of 21-0-0 or equivalent fertilizer, three inches deep and about four inches to the side of the plants. Alternatively, spread nitrogen fertilizer on the soil surface about 4 inches from the plant and water it in. However, too much fertilizer too close to the plant may injure plant roots. Examples of side-dressing timing are: tomatoes—after the first clusters of tomatoes form; sweet corn—when plants are “knee high” and again when they tassel and cucumbers, melons and squash when they begin to produce runners.
Most vegetables are started from seeds or transplants. Seed can be sown directly into the garden soil, while transplants are started elsewhere and later planted into the garden. Harvest can be obtained sooner with transplants; however, it is more expensive and certain plants do not transplant well. Generally, beans, beets, carrots, cucumbers, lettuce, muskmelons, onions, peas, pumpkin, radish, spinach, squash, sweet corn and watermelon are started in the garden from seed. Vegetables like asparagus, broccoli, cabbage, cauliflower, eggplant, peppers, sweet potatoes and tomatoes are generally transplanted, but care needs to be taken to minimize root drying and injury.

A few simple rules need to be followed in seeding:

• Mark out straight rows to make the garden attractive and to make cultivation, insect control and harvesting easier. To mark a row, drive two stakes into the ground at each end of the garden and draw a string tightly between them. Shallow furrows, suitable for small seed, can be made by drawing a hoe handle along the line indicated by the string. For deeper furrows, use the corner of the hoe blade. Use correct spacing between rows.

• Space seeds properly in the row. The number of seeds to sow per foot or hill (more than one seed/hole) is suggested on seed packages or in reference materials. Space the seeds uniformly. Sometimes small seeds can be handled better if they are mixed with dry, pulverized soil or sand and then spread. To aid in spacing seed spread on one layer of toilet paper placed on the soil. The contrast of the white toilet paper will aid in seeing seed spacing. Cover the paper and the seed at the same time.

• Plant at the proper depth. A general rule to follow is to place the seed at a depth about four times the diameter of the seed. Cover small seeds such as carrots and lettuce with no more than ¼ to ½ inch of soil. Place large seeds such as corn, beans and peas 1 to 2 inches deep. In sandy soils seed can be planted somewhat deeper.

• Cover seeds and firm the soil over them by gently tamping the soil by hand or the flat back of a hoe. This prevents rain or sprinkler water from washing away the seeds.

Irrigate with care

Irrigation is necessary for all garden crops in Arizona because of limited and uncertain rainfall. Water enough to keep the soil moist (not wet) in the root zone of the plant throughout the growing season. Excessive fluctuations of soil moisture adversely affect plant growth and quality. Regular applications of water need to be made to prevent the soil from becoming too dry (see Figure C).

Proper watering can be accomplished by observing the plant and soil. Do not allow the plant to become stressed, wilted or slow-growing. On the other hand, too much water, especially on heavy soils, will exclude air from the root zone, resulting in poor growth. When the soil becomes crumbly upon squeezing, it’s time to irrigate. Moisture is needed around the seed for sprouting. Frequent watering will be needed to keep the soil adequately moist and prevent crusting of the surface. A three inch layer of organic mulch will help prevent evaporation. Do not place mulch on top of seedlings or transplants, but around them.

As the plant grows, the watering period should be longer, allowing deeper penetration through the root zone. Determine the moisture depth with a spade or by probing with a stick, trowel or iron rod. Most vegetables are shallow-
Frequency of watering depends on many things. A large plant needs more water than a small plant. A shallow-rooted vegetable (cabbage, onion, lettuce, corn) needs to be irrigated more often than a deep-rooted vegetable (asparagus, tomato, watermelon). Coarse textured soils (sandy loams) need to be irrigated more often than fine-textured (clay or silt loams). Plants need to be watered more often during hot periods than cool periods. In an average situation during warm weather, a good soaking of the soil every 5 to 7 days should give satisfactory results with established plants when using flood or sprinkler irrigation. More frequent watering will be required when using a drip system.

The following irrigation methods are commonly used: furrow, sprinkler, soaker hoses and drip (trickle). The furrow method delivers water alongside the plant row. Water should be kept in the furrow long enough for moisture to completely infiltrate the soil of the root zone. Garden sprinklers apply water on both plants and soil and should not be used if the water is salty. Drip or trickle emitter systems and soaker hoses apply water through a hose which lies beside the crop row. All these methods have a place in Arizona gardens. Traditionally, a raised bed with two rows is used with furrow irrigation, while a flat bed with no furrows is normally used with the other methods. If a watering method moistens the plant foliage irrigate in the morning so plants have time to dry during the day. This will lessen disease problems. Night time watering encourages disease growth. Drip can reduce weed problems.

Plants growing in containers should be watched more closely for water needs because the roots are more crowded and temperatures of root media are more extreme. Keep soil moist but do not over-water. Make holes on the side and/or the bottom of the container for drainage and air.

**Step 8** Mulch & cultivate to control weeds

Weeds compete with vegetables for water, nutrients and light. Weeds often harbor insects and diseases. Two important ways to keep down the weeds in and around your garden are mulching and cultivation. If proper attention is given to controlling weeds when small, time and effort can be saved. Small weeds are easier to control than large ones. When weeds are allowed to get large they can cause many headaches and backaches, and retard plant growth.

Mulching is covering the soil around your vegetables with a protective material. Besides controlling weeds, the mulch will conserve moisture, regulate the soil temperature and keep the vegetables cleaner. With mulch very little cultivation is needed to control weeds. Mulch materials include leaves, straw, sawdust, wood chips, cardboard, newspaper, shredded paper, old carpet, and paper and plastic sheeting.

On established plantings, materials are spread around the plants. With paper or plastic sheeting the material is rolled out on the prepared seedbed and anchored on the edges with soil. Seeds and transplants are planted through holes at the desired spacings. Water can be applied from the side through furrow irrigation or by a trickle/drip tube or soaker hose under the mulch.

Cultivate with a sharp hoe or cultivator just as the seeds begin to sprout. Scrape and loosen the total soil surface around the plants without going too deep, which would cut or damage shallow roots of the vegetable plants. Cultivation will also help aerate the soil and can be used to mix a side-dressing of nitrogen fertilizer into the soil.

Chemical herbicides for weed control are not generally recommended for use in home gardens.

**Step 9** Be prepared for pests and problems

Problems of the garden can be minimized by being prepared for them. Learn about the insects and diseases that commonly occur in the area and learn control methods. Whenever possible select disease resistant varieties. Soil problems can be reduced if the steps mentioned earlier are followed; however, crop injury from salt can appear if proper management has not been followed. Avoid planting vegetables from the same family in the same spot year after year. This practice is referred to as “crop rotation”.

At the lower elevations in Arizona high temperature and shallow watering often cause problems especially when plantings are made too late in the spring or too early in the fall. Also, as temperatures increase more pest problems will occur, be prepared for them. Learn as much as possible from books, bulletins and professionals. Experience is the best teacher on how to handle these problems. Recording treatments in a gardening notebook will be helpful in the future when they occur again.

**Step 10** Harvest at peak quality

The job is not done until top quality vegetables are harvested from the garden. When the “fruits” of your labor are tasted, then it will be worth all the effort.

Most vegetables are at peak quality for only a short period of time and should be harvested. Learn to tell the proper time to harvest each crop. Immature vegetables will not improve after harvest and over-mature vegetables will be tough and lack the desired taste and texture.

To maintain quality after harvest, handle vegetables carefully. Cool and store vegetables like asparagus, broccoli, leafy crops, peas and sweet corn below 40° F.; tomatoes, peppers, cucumbers and eggplant around 55° F. Remove “field heat” as soon as possible, unless they are eaten immediately.

Garden vegetables offer you a variety of experiences and flavors throughout the year. Enjoy them both.
Elevations of locations in Arizona (feet above sea level)

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When to plant vegetables in the Arizona garden

Vegetables differ in their climatic requirements making it necessary to know when to plant them in order to have a successful garden.

Some vegetables will withstand cool and even slight freezing weather. Others need warmer conditions to germinate and to produce. Generally vegetables are placed in two categories—cool-season crops and warm-season crops.

Cool-season vegetables include beet, broccoli, cabbage, carrot, lettuce, onion, pea, potato, radish, spinach and turnip. These are hardy or frost tolerant plants and germinate in cold soil. They can be planted in the fall, winter or early spring depending on location. For best quality these crops need to mature during cooler periods rather than in the heat of the summer.

Warm-season vegetables include beans, cucumber, eggplant, melons, pepper, pumpkin, squash, sweet corn, sweet potato and tomato. These do not tolerate frost but need warm temperatures to set and properly mature fruit. However, high temperatures reduce quality—Examples: sunburned fruit, poorly colored tomatoes and poor ear fill of sweet corn.

Elevation is indicative of climate. In Arizona gardening occurs from almost sea level to over 7,000 feet. Two problem periods exist—the hot summer at lower elevations and cold winter at higher elevations. Since these conditions should be avoided for many vegetables, considerations should be made when planning the garden planting schedule.

At lower elevations up to 3,000 feet, two main planting periods are generally followed—early spring period for warm-season vegetables and late summer to winter period for cool-season crops. In the higher elevations 3,000 to 7,000 feet, there is one main cropping period which is planted during the spring and early summer. Although, at these elevations in Central and Southern Arizona, an early fall planting of cool season vegetables is usually productive.

The lists below give suggested planting dates for different elevations. These guides are based on experience, observation, frost dates, hardiness and other characteristics of vegetable species. Elevations for certain locations in Arizona are listed above. Find the elevation closest to your location and use these dates along with local experience to develop a vegetable planting program. County Cooperative Extension Office can offer advice as well as local nurseries and garden centers.
These diagrams show some commonly-used systems for growing garden vegetables.

Figure A: The soil-bed technique allows for furrow irrigation water to move from furrow ditches into the bed, pushing salts to the center. To avoid salt problems plant near the bed edge. When using furrow irrigation a slight slope is needed so water will run down the furrow. Salt problems to be a greater problem at lower elevations in Arizona where natural precipitation is low.

Figure B: Make raised beds using railroad ties, landscaping wood, lumber, blocks or rocks. The bed is filled with at least one foot of soil, organic matter, sand, perlite and other materials that promote good plant growth. Raised beds should be used when an area does not have good soil. In windy areas, sunken beds might be considered to protect young plants and collect water.

Figure C: Water can be applied by drip or soaker hose as shown here or by furrow, or sprinkler irrigation. There are many types of systems available that apply water efficiently. What ever method is used, adequate watering moves salts down and away from the plant roots. Select a system that meets the need and can be managed properly.
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<tr>
<th>Vegetable Species</th>
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<td>Mar. 1-May 1</td>
<td>Mar. 15-June 1</td>
<td>Apr. 1-June 1</td>
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<td>Sept. 1-Mar. 15</td>
<td>Aug. 25-Apr. 1</td>
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<tr>
<td>Broccoli</td>
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<td>Sept. 1-Dec. 1</td>
<td>July 25-Oct. 1</td>
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<tr>
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<td>Sept. 1-Jan. 1</td>
<td>Sept. 1-Dec. 1</td>
<td>Aug. 15-Oct. 1</td>
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<tr>
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<td>Aug. 15-Dec. 1</td>
<td>Aug. 1-Dec. 1</td>
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<tr>
<td>Cantaloupe</td>
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<tr>
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<td>Sept. 15-Dec. 1</td>
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<td>Sept 1-Jan. 15</td>
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<tr>
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<td>May 10-June 1</td>
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<td>Bean, bush</td>
<td>Apr. 25-July 15</td>
<td>May 15-July 1</td>
<td>May 25-June 15</td>
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<td>May 25-June 15</td>
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<td>May 25-July 1</td>
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<td>May 15-June 15</td>
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<td>April 1-15</td>
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<td>May 15-July 1</td>
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<tr>
<td>Basil</td>
<td>May 1-June 15</td>
<td>May 10-June 1</td>
<td>May 25-June10</td>
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<tr>
<td>Bean, bush</td>
<td>Apr. 25-July 15</td>
<td>May 15-July 1</td>
<td>May 25-June 15</td>
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<tr>
<td>Bean, pole</td>
<td>Apr. 25-July 15</td>
<td>May 15-July 1</td>
<td>May 25-June 15</td>
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<td>Bean, lima</td>
<td>Apr. 25-July 15</td>
<td>May 15-July 1</td>
<td>May 25-June 15</td>
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<td>Bean, edible soy</td>
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<td>May 25-July 1</td>
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<td>May 1-July 15</td>
<td>May15-June15</td>
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<td>Broccoli</td>
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<td>May 15-June 15</td>
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<td>March 15-30</td>
<td>April 1-15</td>
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<tr>
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<td>Apr.15-July 15</td>
<td>May 1-July 1</td>
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<td>Cantaloupe</td>
<td>Aug. 20-Oct. 1</td>
<td>May 1- June 1</td>
<td>May 15-June 15</td>
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<tr>
<td>Carrot</td>
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<td>May 15-July 1</td>
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<td>Celery (plants)</td>
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<td>June 1-July 15</td>
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<tr>
<td>Chard</td>
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<td>July 1-Aug. 1</td>
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<td>June 1-July 15</td>
<td>May 15-June 15</td>
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<td>Vegetable Species</td>
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<td>4500-6000 feet</td>
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</tr>
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<td>---------------------------</td>
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<tr>
<td>Corn, sweet</td>
<td>May 10-July 15</td>
<td>May 25-July 1</td>
<td>June 1-10</td>
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<tr>
<td>Corn, Mexican June</td>
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<td>May 25-June 15</td>
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<td>June 1-25</td>
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<td>May 15-June 15</td>
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<td>Endive</td>
<td>Feb. 1-Apr. 1</td>
<td>Apr. 15-June 15</td>
<td>May 15-June 15</td>
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<tr>
<td>Garlic</td>
<td>Feb. 15-Apr. 10</td>
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<td>Horseradish</td>
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<td>April-May</td>
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<td>Feb. 1-Mar. 20</td>
<td>Feb. 15-Apr. 10</td>
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<td>Kohlrabi</td>
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<td>May 15-June 1</td>
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<tr>
<td>Leek</td>
<td>Feb. 15-Apr. 10</td>
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<td>Lettuce, head</td>
<td>Feb. 15-Mar. 15</td>
<td>July 1-Aug. 1</td>
<td>June 1-30</td>
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<td>Lettuce, leaf</td>
<td>Mar. 1-Apr. 15</td>
<td>Mar. 15-Apr.15</td>
<td>May 1- July 1</td>
</tr>
<tr>
<td>Muskmelon</td>
<td>May 10-June 15</td>
<td>May 15-June 15</td>
<td>Not adapted</td>
</tr>
<tr>
<td>Mustard</td>
<td>Feb. 15-July 15</td>
<td>Apr. 1-July 1</td>
<td>April-May</td>
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<tr>
<td>Okra</td>
<td>May 10-July 1</td>
<td>May 15-June 15</td>
<td>June 1-10</td>
</tr>
<tr>
<td>Onion, green bunch</td>
<td>Feb. 15-May 1</td>
<td>Apr. 15-May 1</td>
<td>May 1-31</td>
</tr>
<tr>
<td>Onion, dry (seeds)</td>
<td>Jan. 15-Mar. 15</td>
<td>Feb. 15-Apr. 15</td>
<td>April 1-30</td>
</tr>
<tr>
<td>Parsley</td>
<td>May 1-June 15</td>
<td>Apr. 1-15</td>
<td>May 1-31</td>
</tr>
<tr>
<td>Parsnip</td>
<td>Mar. 1-May 1</td>
<td>Apr. 1-May 20</td>
<td>April-May</td>
</tr>
<tr>
<td>Pea, spring</td>
<td>Feb. 1-Mar. 15</td>
<td>Feb. 15-Aug. 15</td>
<td>May 1-June 1</td>
</tr>
<tr>
<td>Pea, fall</td>
<td>Aug. 25-Oct. 15</td>
<td>Aug. 1-Sept. 1</td>
<td>Not adapted</td>
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<tr>
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<td>Feb. 15-Mar. 30</td>
<td>Mar. 1-Apr. 1</td>
<td>Apr. 1-15</td>
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<tr>
<td>Pepper (plants)</td>
<td>May 10-June 1</td>
<td>May 10-Aug. 25</td>
<td>May 15-June 1</td>
</tr>
<tr>
<td>Potato, Irish</td>
<td>Mar. 20-Apr. 20</td>
<td>May 10-June 1</td>
<td>May 15-June 1</td>
</tr>
<tr>
<td>Potato, sweet</td>
<td>May 10-25</td>
<td>May 15-20</td>
<td>Not adapted</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>May 15-July 1</td>
<td>May 20-June 15</td>
<td>May 25-June 10</td>
</tr>
<tr>
<td>Radish</td>
<td>Mar. 1-May 15</td>
<td>Apr. 1-June 15</td>
<td>May 15-June15</td>
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<td>Rhubarb</td>
<td>Mar. 1-Apr. 20</td>
<td>Mar. 1-Apr. 1</td>
<td>April 1-30</td>
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<tr>
<td>Rutabaga</td>
<td>Mar. 1-Apr. 1</td>
<td>Apr. 1-May 15</td>
<td>May 1-June 1</td>
</tr>
<tr>
<td>Salsify</td>
<td>Mar. 15-June 1</td>
<td>Apr. 1-May 15</td>
<td>May 1-June 1</td>
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<tr>
<td>Spinach</td>
<td>Feb. 15-Apr. 15</td>
<td>Apr. 1-May 15</td>
<td>May 1-June 1</td>
</tr>
<tr>
<td>Squash, summer</td>
<td>May 10-July 15</td>
<td>May 1-July 1</td>
<td>May 15-June 15</td>
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<tr>
<td>Squash, winter</td>
<td>May 10-July 1</td>
<td>May 15-July 1</td>
<td>May 15-June 10</td>
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</tbody>
</table>
Vegetable Species | 3000-4500 feet | 4500-6000 feet | Above 6000 feet
---|---|---|---
Tomato (seed) | Mar. 1-Apr. 1 | Mar. 1-Apr. 1 | Apr. 1-10
Tomato (plants) | May 1-June 15 | May 10-June 1 | May 25-June 10
Turnip | Mar. 1-Apr. 15 | Apr. 1-May 15 | May 15-June 1
Watermelon | May 10-July 15 | May 1-June 1 | Not adapted

References:
For more information on growing vegetables in Arizona refer to:
Call, R.E. Arizona Master Manual. 1995 http://cals.arizona.edu/pubs/garden/mg
For more detailed publication on vegetable gardening refer to Chapter 7 of the Arizona Master Gardener Manual. http://cals.arizona.edu/pubs/garden/mg
**What is compost?**

Compost is a dark, crumbly, earthy-smelling form of decomposed organic matter that can be easily made at home.

**Why compost?**

- **Carbon-Rich (Brown and dry)**
  - Straw
  - Pine needles
  - Small branches
  - Dryer lint
  - Dry grass clippings
  - Dried plant materials (trimmings, leaves, vines)
  - Sawdust
  - Shredded newspaper

- **Nitrogen-Rich (Green and moist)**
  - Wet grass trimmings
  - Fresh plant clippings
  - Vegetable and fruit wastes
  - Barnyard manures and beddings
  - Alfalfa pellets
  - Tea bags
  - Coffee grounds and filters
  - Hair, fur, feathers

**What can I compost?**

- Meats, grease, fats and oils
- Dairy products, especially cheese
- Dog and cat feces
- Diseased or invasive plants or roots of Bermuda grass
- Oleander, eucalyptus and tamarisk (salt cedar). These contain toxins that inhibit plant growth and should be used sparingly.
- Herbicides and pesticides are neutralized during the composting process. However, compost should be well aged.

**How can I use compost?**

- As a soil amendment for flowers and vegetable gardens, trees, and house plants.
- As part of a seed-starting mix.
- As a liquid fertilizer by brewing a tea of compost in warm water for a day.
- Larger woody pieces can be used as a mulch. Because it is rich and holds water so well, compost should be used sparingly around native plants.
How do I start?

First, select a place in the yard, preferably in the shade, out of the wind, and within reach of water.

Next, you’ll need to assemble a bin to contain your composting organic matter. For little or no cost, a bin can be made from a ring of heavy mesh wire, old pallets, or concrete blocks.

To ensure successful composting, it is a good idea to make your bin a minimum of 30 inches in each direction. This size insulates itself while allowing air to penetrate.

Should you choose not to build a bin, commercially made composting bins offer an easy and attractive way to recycle organic matter at home.

Ten steps to success

Once the bin is constructed, stockpile dry organic materials and follow these ten simple steps:

1. Shred or chop all materials into as small as possible pieces to expose the most surface area for the microbes to work on.

2. Loosen 2” of soil where the bin will stand. Add a 6-12” layer of finger-sized branches to allow air to enter from below.

3. Provide a mixture of about 4 parts brown or woody material (carbon-rich) to one part green or moist (nitrogen-rich). Up to a 50/50 mix can be used.

4. Layer green and brown materials alternately, not more than 4” thick. Occasionally sprinkle in soil and/or manure. If using food waste, be sure to cover it with plenty of carbon material.

5. Ensure pile is very wet. During periods of heavy rain, cover with a tarp or scrap of carpet.

6. Once your container is full, top off the pile with 2” of manure or carbon material.

7. As decomposition takes place, the pile will begin to heat up. Interior heat can reach 165 degrees and can be checked by inserting a metal rod or your hand into the pile.

8. Before the pile cools down to outside temperature, reactivate it by turning the material into a second bin, or use a pitchfork to thoroughly mix the pile. Water and/or green material can be added at this time. NOTE: Step 8 ensures compost in 2 or 3 months. You can turn your pile less often, but it will take longer for finished compost.

9. Repeat these steps as needed until the mixture is soft, dark, and crumbly.

10. To use the finished compost, sift on a 1/2” screen to remove large pieces. Return these to the bin for further breakdown.

Troubleshooting

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad odors.</td>
<td>Not enough air or too wet.</td>
<td>Open pile or turn completely.</td>
</tr>
<tr>
<td></td>
<td>Add brown, dry materials.</td>
<td></td>
</tr>
<tr>
<td>Not composting.</td>
<td>Not chopped up enough.</td>
<td>Repeat Step 1.</td>
</tr>
<tr>
<td></td>
<td>Too dry.</td>
<td>Water and turn pile.</td>
</tr>
<tr>
<td>Will not heat up.</td>
<td>Pile is too small.</td>
<td>3’ x 3’ x 3’ is ideal size.</td>
</tr>
<tr>
<td></td>
<td>Lack of nitrogen.</td>
<td>Add green materials, manure, bloodmeal,</td>
</tr>
<tr>
<td></td>
<td>or fish emulsion.</td>
<td></td>
</tr>
<tr>
<td>Flies or ants in pile.</td>
<td>Food waste not covered.</td>
<td>Cover with 2” layer of carbon material or manure.</td>
</tr>
</tbody>
</table>
Food waste composting for small spaces

Soil Incorporation: Chop kitchen waste, run through a blender or food processor with lots of water. Bury this “soup” in holes or trenches directly in garden or flower beds around plants. Fill with soil and water well. Seeds or transplants can be planted immediately.

Worm Boxes: For use on shaded balcony or carport, use a wooden or plastic box with small drainage holes in the bottom and a loose fitting lid if possible. As an example, a 2’X 2’X 12” box will compost the kitchen scraps from 4 people, about 4 pounds a week. The box should be filled with moistened bedding made from shredded newspaper, dried leaves, and/or peat moss. Add at least 100 red wiggler worms. Dig chopped or blended scraps into a different place each week. A fitted piece of carpet works well as a cover, retains moisture and helps to keep temperatures down—85 degrees is the upper limit for worms to thrive. Remove the “vermicompost” every 3 months. Refill the box and transfer the worms. A bottomless box can be placed directly on loosened soil. Fill in the same manner. After 3 months, lift the box and use the vermicompost as a fertilizer. Start again in the same place or a new one. Keep shaded and moist during extreme heat.

More questions?

Call the Tucson Organic Gardeners Infoline at 670-9158; or surf the TOG Web site at tucsonorganicgardeners.org

A Compost Expert is available for consultation the 2nd and 4th Saturday of each month at the Home Composting Demonstration Site located at the Tucson Botanical Gardens, 2150 N. Alvernon Way, Tucson, Arizona.
Winter hours: September - May, 10 AM to 2 PM
Summer hours: June - August 8:30 AM - 10:30 AM

Composting workshops are offered periodically. Call The Tucson Organic Gardeners Infoline, 670-9158. Also available are school programs and group consultation. We will hold a workshop at your work place for a minimum fee.

Compost Education Kits for Primary and Secondary levels are available to check out for your classroom. Just call the infoline, 670-9158, to reserve one.

Attend monthly meetings of the Tucson Organic Gardeners, held the 3rd Tuesday of each month, September through April, at 7 P.M. Call 670-9158 for location.

Take a closer look

Nature has its own composting program using millions of microorganisms (bacteria and fungi). Earthworms and grubs assist in reducing material into basic elements such as nitrogen, phosphorus, and potassium. These are the very things contained in commercial fertilizers. By composting at home, we speed up the process that nature accomplishes in a much slower way.

In order to live and work in a compost pile, microorganisms must have oxygen, water, nitrogen, and carbon. Dry, brown, woody materials are high in carbon, and supply daily energy. Green, moist, dense materials provide nitrogen. It provides the food for microorganisms building their bodies and reproduction. When the right food is provided and conditions are right, the microorganisms reproduce so much that heat is produced. The faster these workers eat and reproduce, the hotter the pile gets. A compost bin, in effect, is a factory where a new product called humus, or compost, is produced.
Irrigation Repair Guide

The irrigation system has a hard plastic main line running along all of the plots (1). The main line should have two valves (2), with a tapered opening pointing towards your plot. There are two green tabs for opening (3) and closing (4) these valves. Each plot has (or will have) two flexible, plastic tube lines connected to the valves on the main line. These are your plots irrigation lines (5). Water will drip out from the seam running the length of the line.

HOW?

1. Cut irrigation tube the length of your plot
2. Push the tube over the main line valve
3. Turn the connection nuts to tighten
4. Close off the open end of the tube

WHEN?

- More than 3 major repairs means the line is too old
- Adding lines to a new plot
- Calcified Lines

Small Leak

- If water is on, turn green tab to shut it off
- Using electrical tape, wrap hole several times
- Check hole regularly for leaks

Large Leak

- If water is on, turn green tab to shut it off
- Cut hole out, using straight across cuts
- Insert 2 remaining segments onto either end of an orange and black connector (found in shed). Tighten the orange nuts.

Geyser

- Locate emergency shut off valve
- Shut off water. If the valve is locked, see next step

Calcified Lines

- You can also wash the line with a water and white vinegar mix

Contact Site Coordinator and Garden Technician
Drip irrigation – also known as low-flow, micro, and trickle irrigation – is the slow, measured application of water through devices called emitters. It is the most efficient way to irrigate. A wide variety of quality products has been developed to make drip irrigation reliable and easy to use for almost any landscape situation.

**Why should I use drip irrigation?**

Drip irrigation saves water because little is lost to runoff or evaporation. This watering method, if implemented correctly, promotes healthy plant growth, controls weed growth, and reduces pest problems.

**What types of landscapes are best suited for drip irrigation?**

Most of your landscape can be watered with drip irrigation except for turf areas. Drip systems are particularly well suited for desert landscapes, places where runoff can be a problem, and small, narrow areas such as entryways.

Drip is also a great way to water vegetable gardens, fruit trees, and potted plants.

There is a wide assortment of equipment to suit most budgets and watering needs.
What are the components of a drip irrigation system?

**Controller/ Timer:**
Controllers or timers are also called irrigation clocks. They are programmed to automatically turn on control valves for a specific amount of time and for certain days. This determines how often and for how long the irrigation system is turned on.

**Backflow Preventor:**
This prevents water in the irrigation system from flowing back into the potable water supply. Backflow preventers are required for all irrigation systems and installation is regulated by county, municipal, or local codes.

**Valves:**
Valves turn the water in the irrigation system on or off. They can be manually or automatically operated and are wired to the irrigation controller.

**Filter:**
Filters screen particles out of the irrigation lines to maintain a clean water supply. Even small particles can plug the small openings of emitters and restrict or block water flow.

**Pressure Regulator:**
Drip systems require low pressure of about 20 psi. A pressure regulator reduces the incoming water pressure which can range from 50 to 75 psi for most water supplies to levels suitable for a drip system.

**Pipe:**
Rigid PVC (polyvinyl chloride) pipe and flexible polyethylene tubing are commonly used for lateral irrigation lines. These lines are generally buried in the soil.

**Micro-Tubing:**
These lines are also known as ‘¼ inch’ or ‘spaghetti’ tubing and deliver water from the lateral lines to the emitters or directly to the plant. The length of micro-tubing from the lateral line to the plant should not exceed 5 feet.

**Emitters:**
They deliver water to the plants at slow rates, usually at 0.5, 1, 2, or 4 gallons per hour (gph). Emitters are either located at the end of the micro tubing or between the polyethylene tubing and micro-tubing. In drip tape or polyethylene drip lines emitters are located inside the lines spaced at various intervals.

Flush Valve/ Cap:
Flush caps are attached to the end of each lateral line. They are removed periodically to flush particles and debris from the irrigation laterals.

Can I design my own drip irrigation system?
Yes, designing your own drip system is not difficult to do, but it does require some careful planning. Make a drawing of the final installation design of your system, and keep it for your records.

- Group plants with similar water requirements such as trees, shrubs, ground covers and turf on separate valves. Know the number of plants for each type and their water requirements.
- Design with consideration to pipe length, size and elevation changes.
- Plan to expand your irrigation system as plants grow. Move emitters out to the edge of the canopy (dripline) where roots will take up water. Evaluate whether you need more emitters or change existing emitters to deliver more water at a faster rate.
- Select quality equipment. Spending a little money up front will save time and money later. Local irrigation suppliers are a good source of advice.

Can sprinklers be converted to a drip system?
Yes, there are products that can be installed in place of sprinkler heads. Keep in mind that sprinklers and drip emitters apply water at different rates. When converting to a drip system, all sprinklers in the same zone and on the same valve need to be changed. Sprinkler and drip irrigation apply water at different rates and operate under different pressure, requiring separate valves. Drip systems need a pressure reducer and a filter to protect drip emitters from high pressure and clogging.

Remember...
- Follow manufacturer’s installation recommendations.
- Set and change watering schedules according to plant water need, weather and seasons, and soil texture.
- Keep filters clean and flush system periodically.
- Visually inspect emitters and lines monthly to ensure proper water delivery.
- Expand your system as the plants grow.
- Keep good records of your installation design.
- Winterizing your drip system may be necessary in cold areas to prevent freeze damage.
This drip irrigation system has three valves for plants with different water needs. Vegetables are watered most frequently with drip tape installed in the bed. Small shrubs and groundcovers have individual drip emitters with low flow rates (0.5 or 1 gph). Trees and large shrubs have multiple emitters with higher flow rates (4 gph) and are watered deep and infrequent.
For questions about irrigation or water conservation assistance, contact your local Cooperative Extension Office.

Resources:

Adapted with permission from the Arizona Municipal Water Users Association’s “Drip Irrigation” brochure.
This planting guide gives you information about what vegetables and fruits you can plant INTO YOUR GARDEN during each season in Tucson.

Some plants, like lettuce or radishes, can be replanted every 2-4 weeks, for a continuous harvest.

All vegetables and fruits listed can be directly planted from seed into your garden unless they say “plant” next to them. Those will do better by planting a seedling. You can grow seedlings, but it takes special care and advance planning. Call the number below for more information about starting small plants.

** These seeds need to be protected from cold and freezing in fall/winter and heat in spring/summer. Start seeds indoors with lots of light, or in a small greenhouse or shade house. In 6-8 weeks the plants will be ready to plant outside.

Compiled from Tucson Organic Gardeners (tucsonorganiccgardeners@hotmail.com) & Native Seeds/SEARCH (www.nativeseeds.org)

Call 622-0525 if you have questions about your garden
www.communityfoodbank.org
**Temporada para Sembrar Vegetales**

- Este guía le ofrece información acerca de cuáles verduras y frutas usted puede poner en el JARDÍN durante cada temporada en Tucson.
- Algunas plantas, como la lechuga y el rábano, pueden ser plantadas cada 2-4 semanas para poder cosecharlas continuamente.
- Toda verdura y fruta aquí puede ser plantado directo de semilla a menos que la palabra “planta” la siga en la lista. Las que dice “planta” crecen mejor si se planta una plantita en el jardín. Usted se puede cultivar estas plantitas usted mismo, pero requiere cuidado. ¡Llame al número abajo para más información!

### Enero-Febrero

<table>
<thead>
<tr>
<th>Semilla</th>
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</thead>
<tbody>
<tr>
<td>Araucaria</td>
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</tr>
<tr>
<td>Espárragos</td>
<td>Colnabo</td>
</tr>
<tr>
<td>Betabel</td>
<td>Puerro</td>
</tr>
<tr>
<td>Chile (semina)</td>
<td>Lechuga</td>
</tr>
<tr>
<td>Chile (Bell) (semina)</td>
<td>Mostazas</td>
</tr>
<tr>
<td>Bok Choy (chino)</td>
<td>Cebollas y chalotes</td>
</tr>
<tr>
<td>Zanahoria</td>
<td>Peréjil</td>
</tr>
<tr>
<td>Aceña</td>
<td>Chirivía</td>
</tr>
<tr>
<td>Chía</td>
<td>Rábano</td>
</tr>
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<td>Achiocoria</td>
<td>Nabo Sueco</td>
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<tr>
<td>Cilantro</td>
<td>Espinacas</td>
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<tr>
<td>Collards (Acélaga)</td>
<td>Tomates (semina)**</td>
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<tr>
<td>Corn Salad (Acélaga)</td>
<td>Nabo</td>
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<tr>
<td></td>
<td>Flores del campo</td>
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### Junio

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</tr>
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<tbody>
<tr>
<td>Chile (semina)**</td>
<td>Tomate (semina)**</td>
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<td>Chile (Bell) (semina)**</td>
<td>Tomatillos (semina)**</td>
</tr>
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<td>Berenjena (semina)**</td>
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### Julio-Agosto

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<td>Frijoles de Arbusto y Asta</td>
<td>Melón</td>
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<tr>
<td>Brócoli (semina)**</td>
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<tr>
<td>Maíz</td>
<td>Calabacitas</td>
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<td>Chile (planta)</td>
<td>Girasoles</td>
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<td>Coliflor (semina)**</td>
<td>Tomate (planta)</td>
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<tr>
<td>Chile (planta)</td>
<td>Tomatillos (planta)</td>
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<td>Chile (bell) (planta)</td>
<td>Calabaza</td>
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### Mediados de Marzo

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<td>Pimiento (Bell)</td>
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<tr>
<td>Frijoles de Arbusto y Asta</td>
<td>Rábano</td>
</tr>
<tr>
<td>Maíz</td>
<td>Calabacitas</td>
</tr>
<tr>
<td>Chile (planta)</td>
<td>Girasoles</td>
</tr>
<tr>
<td>Pepino</td>
<td>Tomate (planta)</td>
</tr>
<tr>
<td>Berenjena (planta)</td>
<td>Tomatillos (planta o semilla)</td>
</tr>
<tr>
<td>Guajes</td>
<td>Calabaza</td>
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### Septiembre-Noviembre

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<tr>
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<tr>
<td>Espárragos</td>
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</tr>
<tr>
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<td>Col Rizada</td>
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<td>Bok Choy</td>
<td>Colnabo</td>
</tr>
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<td>Brócoli (planta)</td>
<td>Puerro</td>
</tr>
<tr>
<td>Col de Bruselas</td>
<td>Lentejas</td>
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<tr>
<td>Repollo (planta)</td>
<td>Lechuga</td>
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<td>Zanahoria</td>
<td>Mostazas</td>
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<td>Coliflor (planta)</td>
<td>Cebollas y chalotes</td>
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<tr>
<td>Apio</td>
<td>Chicharos</td>
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<td>Acelga</td>
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<td>Chirivía</td>
<td>Nabo Sueco</td>
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<td>Cilantro</td>
<td>Espinacas</td>
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<td>Collards (Acélaga)</td>
<td>Nabo</td>
</tr>
<tr>
<td>Habas</td>
<td>Flores del campo</td>
</tr>
</tbody>
</table>

**Estas semillas necesitan ser protegidas de las heladas en otoño/invierno y del calor en la primavera/verano. Siembre las semillas en su casa con mucho sol, o en un invernadero. Después de 6-8 semanas serán listas para plantar en el jardín.**

Compilado de Tucson Organic Gardeners (tucsonorganicgardeners@hotmail.com) & Native Seeds/SEARCH (www.nativeseeds.org)

Llame a 622-0525 con preguntas acerca de su jardín.

www.communityfoodbank.org
<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Germ. Soil Temp. °F</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Artichoke/Cardoon</td>
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<td>T</td>
<td>T</td>
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<tr>
<td>Arugula</td>
<td>40-95</td>
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<tr>
<td>Asian Greens</td>
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Notes: 1. If planting seeds indoors, plant 8 weeks before planting time.
2. Potatoes and Jerusalem Artichokes are planted from seed potatoes.
3. May be restrictions when planting pumpkins and mint.
4. Quality herb production is best achieved with filtered sun.
5. Speak to the site coordinator about Amaranth, Asparagus, Lemon Balm, Lemon Verbena, Lemon Grass, Lima Beans.

Legend:
- Unwise to plant
- Sow Seeds
- Sow Seeds & Transplant
- Transplant

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<td>Sage</td>
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<td>T</td>
<td>T</td>
<td>Tarragon (French)</td>
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</tr>
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<td>T</td>
<td>T</td>
<td>T</td>
<td>Thyme</td>
<td></td>
</tr>
</tbody>
</table>

*Bolded text indicates 3 potatoes. * 

int at CGT gardens. Mints may need to be planted in containers. See your Site Coordinator. 

open shade during hot months. 

, Chervil, Cress, Dandelion, Epazote, Fennel, Horseradish, 

s, Mache, Marjoram, Purslane, Rhubarb, Shiso, Stevia. 

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<table>
<thead>
<tr>
<th>CROP</th>
<th>SEASON</th>
<th>PLANTING DEPTH</th>
<th>DISTANCE</th>
<th>HELPFUL TIPS</th>
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</thead>
<tbody>
<tr>
<td>AMARANTH</td>
<td>Spring, Monsoon</td>
<td>¼”</td>
<td>Thin to 10-15” apart</td>
<td>Broadcast seeds</td>
</tr>
<tr>
<td>BEANS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>6”</td>
<td>Plant with corn &amp; squash</td>
</tr>
<tr>
<td>Lima</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>6”</td>
<td>Plant with corn &amp; squash</td>
</tr>
<tr>
<td>Runner</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>6”</td>
<td>Use trellis, does not tolerate heat</td>
</tr>
<tr>
<td>Tepary</td>
<td>Monsoon</td>
<td>½”</td>
<td>4”</td>
<td>Avoid overwatering</td>
</tr>
<tr>
<td>Wild</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>4”</td>
<td>Soak seeds overnight</td>
</tr>
<tr>
<td>CHILES</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>6-12”</td>
<td>Start inside 6 weeks before transplanting</td>
</tr>
<tr>
<td>CHILTEPINES</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>12”</td>
<td>Transplant under mesquite trees</td>
</tr>
<tr>
<td>CORN</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>12” in rows that are 1-2” apart, or in hills 3-6” apart with 4 seeds</td>
<td>Plant in blocks of several hills or rows instead of a single row to increase pollination</td>
</tr>
<tr>
<td>COTTON</td>
<td>Spring</td>
<td>½”</td>
<td>12”</td>
<td>Soak seeds overnight</td>
</tr>
<tr>
<td>COWPEA</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>6”</td>
<td>Great nitrogen fixer</td>
</tr>
<tr>
<td>CUCUMBER</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>3-6” in basins 48” apart, 12-24” in rows</td>
<td>Trellis</td>
</tr>
<tr>
<td>DEVIL’S CLAW</td>
<td>Monsoon</td>
<td>½”</td>
<td>24”</td>
<td>Peel open outer seedcoat</td>
</tr>
<tr>
<td>EGGPLANT</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>12”</td>
<td>Start inside 6 weeks before transplanting</td>
</tr>
<tr>
<td>FAVA</td>
<td>Fall, Early Spring</td>
<td>1”</td>
<td>6”</td>
<td>Great nitrogen fixer</td>
</tr>
<tr>
<td>GARLANZO</td>
<td>Fall, Early Spring</td>
<td>½”</td>
<td>6”</td>
<td>Do not transplant</td>
</tr>
<tr>
<td>GREENS</td>
<td>Fall, Early Spring</td>
<td>¼”</td>
<td>Thin to 10-15” apart</td>
<td>Broadcast seeds and thin</td>
</tr>
<tr>
<td>GOURDS</td>
<td>Spring</td>
<td>1”</td>
<td>3-6” in basins 48” apart, 12-24” in rows</td>
<td>Can be trellised</td>
</tr>
<tr>
<td>HERBS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basil, Epazote</td>
<td>Spring, Monsoon</td>
<td>¼”</td>
<td>6-12”</td>
<td>Frost sensitive</td>
</tr>
<tr>
<td>Cilantro, Dill, Thyme, Oregano, Parsley</td>
<td>Fall</td>
<td>¼”</td>
<td>1-2”</td>
<td>Cold tolerant</td>
</tr>
<tr>
<td>INDIGO</td>
<td>Spring</td>
<td>½”</td>
<td>12”</td>
<td>Scarify seeds</td>
</tr>
<tr>
<td>MELON</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>12-48”</td>
<td>Plants will sprawl</td>
</tr>
<tr>
<td>OKRA</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>12-18”</td>
<td>Scarify seeds and soak overnight</td>
</tr>
<tr>
<td>ONION</td>
<td>Fall</td>
<td>1”</td>
<td>2-3”</td>
<td></td>
</tr>
<tr>
<td>PANIC GRASS</td>
<td>Monsoon</td>
<td>¼”</td>
<td>Broadcast seeds</td>
<td>Rake in seeds</td>
</tr>
<tr>
<td>PEAS</td>
<td>Fall, Early Spring</td>
<td>½”</td>
<td>6”</td>
<td>Do not tolerate the heat</td>
</tr>
<tr>
<td>ROOT VEGETABLES</td>
<td>Fall, Early Spring</td>
<td>¼”-½”</td>
<td>Varies</td>
<td>Cold tolerant, thin seedlings to avoid overcrowding</td>
</tr>
<tr>
<td>SORGHUM</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>10”</td>
<td></td>
</tr>
<tr>
<td>SQUASH</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>3-6” in basins 48” apart, 12-24” in rows</td>
<td>Plant with corn &amp; sunflowers</td>
</tr>
<tr>
<td>SUNFLOWERS</td>
<td>Spring, Monsoon</td>
<td>1”</td>
<td>12”</td>
<td>Plant with beans &amp; cucumbers</td>
</tr>
<tr>
<td>TEOSINTE</td>
<td>Monsoon</td>
<td>½”</td>
<td>4-6”</td>
<td>Plant around corn, soak seeds overnight</td>
</tr>
<tr>
<td>TOBACCO</td>
<td>Spring, Monsoon</td>
<td>Rake in &lt;¼”</td>
<td>Thin to 12”</td>
<td>A natural insecticide</td>
</tr>
<tr>
<td>TOMATILLOS</td>
<td>Spring</td>
<td>½”</td>
<td>15”</td>
<td>Start inside 6 weeks before transplanting</td>
</tr>
<tr>
<td>TOMATOES</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>15”</td>
<td>Start inside 6 weeks before transplanting</td>
</tr>
<tr>
<td>WATERMELON</td>
<td>Spring, Monsoon</td>
<td>½”</td>
<td>24-48”</td>
<td>Plants will sprawl</td>
</tr>
<tr>
<td>WHEAT</td>
<td>Fall, Early Spring</td>
<td>½”</td>
<td>3-6”</td>
<td>Broadcast and rake in for small spaces</td>
</tr>
</tbody>
</table>
**General Instructions**  Gardening in the Southwest can sometimes be a challenge. For thousands of years, Native Americans have been and continue to be successful gardeners and farmers in this region. Planting seasonally appropriate crops, using arid-adapted seed varieties, and managing water and soils are keys to successful gardening in this region.

**Soils**  Organic matter should be added to most garden soils. Compost or manures add nutrients and improve soil texture, allowing for better water holding capacity. Amendments should be added annually. Add sand (20-30%) to heavy clay soils to improve water percolation.

**Water & Mulch**  Desert-adapted seeds need moisture to germinate and require water throughout their growing cycle, however they “tolerate” heat and drought better than varieties from less arid climates. Mulch around plants (at least 3” thick). Plant seeds in individual basins or sunken beds to collect and hold more moisture and concentrate water around each plant to penetrate deeply and encourage deep root growth. Basins and sunken beds will also keep soil and roots cooler.
Mediterranean Gardening: In Tucson!

Tucson shares a similar climate to many Mediterranean countries: sunny, warm, and with little summer rain. Although our temperatures and sunshine are more extreme, with a little care we can still grow many of the same crops as those seen throughout the Mediterranean! Fill your garden with crops like tomatoes, eggplants, potatoes, herbs, figs, pomegranates, olives, and citrus to bring the Mediterranean to your backyard.

Vegetables:

Tomatoes: There are two types of tomato: determinate (producing only one crop) and indeterminate (produces multiple crops through the summer and fall)

- **Planting**: Choose smaller varieties that ripen within 70 days, these grow best in our region (think Brandywine, Better boy, Carmello, Champion, Early girl, Roma, and Punta Banda varieties). Use a transplant, and plant through March in soil that is heavily composted. Choose a space in your garden that receives afternoon shade to protect your plant.
- **Watering, fertilizer, and general care**: Keep soil moist 18-24 inches deep and make sure to water evenly. Use seaweed fertilizer or fish emulsion every 2 weeks to help increase the heat tolerance of your plant.
- **Harvest**: Once it gets hot, help tomatoes to pollinate a few times a week by gently shaking or using a small paintbrush to transfer pollen between flowers. Tomatoes are ready when they’ve reached a deep red color (unless you’ve planted another variety!) and can easily be twisted off of the stem.
- **Companions**: Asparagus, Basil, Corn, Marigolds, Peas, Sunflowers, Sage.

Eggplant: Comes in many varieties that range in color, size, and shape. Most varieties will work well in Tucson as long as you give them enough water, just plant what you like!

- **Planting**: Plant in warm soil, otherwise growth will be stunted (March is usually a good time). Eggplant thrives well when planted in groups, so keep plants together about 12-18 inches apart. Your soil should have a lot of organic material and drain well.
- **Watering, fertilizer, and general care**: Use only a drip irrigation or other ground level watering, as overhead water will damage fruit. Water to about two feet, keeping soil...
moist at all times. It can be helpful to use a tomato cage to support heavy plants as they grow.

- **Harvest:** Harvest frequently for more production (if you wait to harvest, the plant will stop producing), it is ready when fruit looks shiny and firm. Cut fruit rather than pulling from the plant in order to avoid damage.

- **Companions:** Artemisia, Beans, Lavender, Marigold, Tansy.

### Potatoes:

- **Planting:** Try to plant in January or February, when soil is still cool. Always avoid heavy soils, which can be done several ways: planting in sandy soil, planting in a mound of mulch, planting in a bucket or alternative container
  - Sandy soil: plant mini-tubers or cutting 4-6 inches deep, 12 inches apart
  - Mounding mulch: place mini-tubers or cutting 2 inches deep in loosened soil, cover with 18 inches of compost or mulch
  - Container: plant mini-tuber or cutting deeply in a bucket or other container, cover with 3 inches of compost. As the plant grows, continue to add compost or mulch to the container.
- **Watering, fertilizer, and general care:** Irrigate regularly to 18-24 inches, letting soil dry out between watering. Additional fertilization is unnecessary if using a well composted soil and lots of mulch.
- **Harvest:** Harvest potatoes at any size you like! Baby or new potatoes will be done early in the season. When visible vines wilt or die, your potatoes are ready to harvest.
- **Companions:** Corn, Beans, Peas, Cabbage, Strawberries, Nasturtiums, Marigolds.

### Herbs:

Herbs are a very important part of Mediterranean cooking! They also look beautiful and make your garden smell great. Mediterranean herbs that grow well in full sun or partial shade: Basil, Dill, Fennel, Mint, Lavender, Parsley, Sage, Rosemary, and Thyme.

- **Planting:** Can be planted from seed, cuttings, or transplants. All herbs listed above can be grown in a container or in the ground except mint, which will take over the bed it is planted in. Planting in containers allows you better control over the spread of the herbs and allows you to move them around for optimum sun level.
• **Watering, fertilizer, and general care:** Water in the early morning or late evening every day to keep soil slightly damp but not waterlogged. Note that growing herbs in containers will likely require more water than those grown in the ground.

  • **Harvest:** Harvest herbs frequently, pinch or cut off tips to encourage growth

**General Care:**

**Shade:**

• Sunflowers work very well as a companion plant during the summer because they grow large and provide shade
  
  ○ Trees and other tall plants are also well suited for this

• Shade cloth (40-50%) and alternatives can be very helpful in protecting plants, it’s especially nice because it can be moved around to the plants that really need it
  
  ○ Alternatives to shade cloth: old white (or other light colored) bed sheets, netting (i.e. camouflage for hunting or military supply), or burlap
    
    ▪ Just make sure whatever you use has some holes for ventilation and to allow for some light

• Use existing structures: avoid planting on the north side of your home; this area will receive the most light. Find areas that receive morning sun and afternoon shade for maximum plant health (these are usually south and west-facing areas of your yard)

**Water:**

• Deep watering is very important, try to keep soil moist to AT LEAST 6 inches at all times- test soil often to make sure it’s staying moist

• Water early in the morning, before temperatures reach 90 degrees. If you miss this window of time, wait to water until it cools again in the night.

• Use 6-12 inches of mulch such as compost alfalfa hay, newspaper, wood chips, pecan shells, or even gravel to help your soil conserve water (this prevents evaporation)
  
  ○ Just make sure to do this after your plants have grown up a little so they don’t become damaged
**Style Points:**

In the Mediterranean, gardening is a way of life. The style is rustic, calm, and old world. To bring this aesthetic to your yard, consider the following:

- Low walls and overhead hangings, tiles, pavers, and gravel throughout your garden space
- Lots of earth tones with some bright accent colors (like red, purple, or blue)
- Shrubs, grass-like plants, “soft” flowers like lavender used to fill out garden spaces
- Lots of pots, especially terra cotta
- Small fountains, courtyard pools, or other water elements add serenity
- Places to sit! Mediterranean gardens are meant to be lived in, provide tables and chairs to do just that.
**Summer Gardening**

Tucson has 5 growing seasons because our summer actually spans 2 seasons, we call them “summer” and “late summer” or the “monsoon” season. After this class, you will know which plants grow in each season and how to care for your garden during this harsh time of year.

**Early Summer:**

Okra:

- **Planting:** Soak seeds in water for 24 hours, afterwards plant ½ inch deep and 5 inches apart. Can be planted through May
- **Watering and Fertilizer:** Keep soil moist 18-24 inches deep. Use seaweed fertilizer or fish emulsion every 2 weeks for robust plants.
- **Harvest:** Okra will start producing fruit when your plant is about 1 foot high, to keep a healthy crop harvest every day. If production slows down mid-summer, prune the top of your plant to stimulate new growth.
- **Companions:** Alyssum, Marigolds, Nasturtiums

Summer Squash (Crookneck, Zucchini, Pattypan, Straightneck):

- **Planting:** Dig a hole and fill with compost rich soil, mounding several inches above the ground. Plant seeds ½ to 1 inch deep into your pile (roots will reach down to get nutrients and water). Thin to 18-24 inches apart once sprouted.
- **Watering, fertilizer, and general care:** Squash must be watered very deeply, at least 24 inches. You can use a paintbrush to “assist” with pollination if needed. Follow fertilizing instructions on your brand of vegetable fertilizer.
- **Harvest:** Harvest frequently for more production (leaving them to get large will slow production)
- **Companions:** Corn, Nasturtiums
Late Summer (Monsoons):

Beans (Bush- Rolande, tri-color mix, mini-bean yellow, mon-petit cheri and pole- Kentucky Blue, Blue Lake, True Blue):

- **Planting:** Do not pre-soak seeds, plant seeds 1 inch deep and 3 inches apart. As plants grow they shouldn’t touch (thin to about 6 inches apart). Beans can be planted from mid-July to mid-September.
- **Watering, fertilizer, and general care:** Water to about 18 inches deep, water directly at the soil as overhead sprinkling will damage plants. Fertilizer is not a priority, beans are actually soil feeders! Pole beans will need a trellis or other device to climb.
- **Harvest:** Will produce a large number of fruit, which should be harvested often to promote more growth
- **Companions:** Corn, Cucumbers, Sunflowers (bush only), Calendula, Radishes

Corn (honey and cream, early sun glow):

- **Planting:** Put directly into compost rich well-drained soil 1-2 inches deep about 2 inches apart. Plan to thin as they grow, and stick to one variety in smaller spaces. Corn can be planted from mid-July to September and prefers “squares” to rows.
- **Watering, fertilizer, and general care:** Corn needs A LOT of water, and must be watered at ground level as overhead sprinkling washes pollen tassels. Water to about 18 inches deep and requires fertilizer every 2 weeks (follow instructions on your brand) or using seaweed extract. Corn will attract corn borer and ear-worms, which can destroy a crop quickly so be careful.

*Note:* corn should be followed by beans or other “soil feeding” plant at the end of the season

- **Harvest:** Harvest when silks are brown and not dried, kernels should feel “milky” when popped between fingers. Eat immediately for maximum flavor!
- **Companions:** Beans, Bachelor’s Button, Sunflowers
**General Care for Your Summer Garden:**

**Shade:**

- Sunflowers work very well as a companion plant during the summer because they grow large and provide shade
  - Trees and other tall plants are also well suited for this
- Shade cloth (40-50%) and alternatives can be very helpful in protecting plants, it’s especially nice because it can be moved around to the plants that really need it
  - Alternatives to shade cloth: old white (or other light colored) bed sheets, netting (i.e. camouflage for hunting or military supply), or burlap
    - Just make sure whatever you use has some holes for ventilation and to allow for some light
- Use existing structures: avoid planting on the north side of your home; this area will receive the most light. Find areas that receive morning sun and afternoon shade for maximum plant health (these are usually south and west-facing areas of your yard)

**Water:**

- Deep watering is very important, try to keep soil moist to AT LEAST 6 inches at all times-test soil often to make sure it’s staying moist
- Water early in the morning, before temperatures reach 90 degrees. If you miss this window of time, wait to water until it cools again in the night.
- Use mulch such as alfalfa hay, newspaper, wood chips, pecan shells, or even gravel to help your soil conserve water (this prevents evaporation)
  - Just make sure to do this after your plants have grown up a little so they don’t become damaged
- During the monsoon season, consider some basic rain water harvesting to save on your water bill
  - Keep buckets outside or just bring them out as the rains start
  - To prevent mosquitoes, add BT (otherwise known as mosquito “dunks”) to your barrels-these are bacterial strains that provide an organic mosquito solution
If barrels will be staying outside, make sure to cover them with a screen or lid (when it’s not raining) to avoid debris contamination

Suggested Reading:

- *Extreme Gardening* by Dave Owens “The Garden Guy”
  - This book is a great step-by-step guide for growing in the Sonoran Desert. Provides detailed information for various plants including best fertilizers, planting practices, pests to look for, and companion plants. It also provides general information about soils, fertilizers, organic pest control, and the best type of garden for your need. (We use this book all the time at TGK!)

- *The Tucson Garden Handbook* by the Pima County Master Gardeners
  - Provides general care and maintenance information for gardening in Tucson, also includes suggested varieties.

- *Rainwater Harvesting for Landscape Use* By Patricia H. Waterfall from The University of Arizona Cooperative Extension
  - More detailed information about harvesting rainwater to use in your garden

More Resources:


Handout courtesy of Brandon Merchant
Winter Gardening (Sep 5\textsuperscript{th} 2015)

Winter is one of the best times to garden here in the Tucson area. You can grow so many more vegetables during the fall/winter here than you can during the summer months. September is a great time to start planting in this area because the heat of the summer is passing and the soil is still warm and moist from the monsoon season.

What To Grow:

Carrots/Radishes:

- \textit{Planting}: Plant carrots and radishes in rows that are about 1 foot apart, also seeds should be planted about ½ an inch deep and 1-2 inches apart.
- \textit{Watering and Fertilizer}: Water gently ideally with a watering can to avoid washing your seeds away, soil should be continuously moist.
- \textit{Harvest}: Carrots are mature at around 2 ½ months and about ½ inch in diameter. You may harvest whenever desired maturity is reached. Radishes mature within 3-4 weeks depending on the variety.
- \textit{Companions}: Beans, Chives, Onions, Dill, Lettuces

Broccoli:

- \textit{Planting}: Plant seeds 1/2 inch deep, or set seedlings just a tad deeper than grown originally. Within a row, space your plants 12 to 24 inches apart with 36 inches between each row. Space plants 12 to 24 inches apart. If you over seed, you will need to thin out the seedlings to 12 inches apart to give room for the broccoli to grow.
- \textit{Watering, fertilizer, and general care}: Provide consistent soil moisture with regular watering, especially in drought conditions. Some varieties of broccoli are heat tolerant, but all need moisture. Follow fertilizing instructions on your brand of vegetable fertilizer, organic fertilizers recommended and fertilize every 4-6 weeks.
- \textit{Harvest}: Harvest Broccoli when the buds of the head are firm and tight before the heads flower. If you do see yellow petals then harvest immediately.
- \textit{Companions}: Beans, Beets, Dill, Marigolds, Nasturtiums
Beans:

- **Planting:** Do not pre-soak seeds, plant seeds 1 inch deep and 3 inches apart. As plants grow they shouldn’t touch (thin to about 6 inches apart). Beans can be planted from mid-July to mid-September.
- **Watering, fertilizer, and general care:** Water to about 18 inches deep, water directly at the soil as overhead sprinkling will damage plants. Fertilizer is not a priority, beans are actually soil feeders! Pole beans will need a trellis or other device to climb.
- **Harvest:** Will produce a large number of fruit, which should be harvested often to promote more growth
- **Companions:** Corn, Cucumbers, Sunflowers (bush only), Calendula, Radishes

Cauliflower:

- **Planting:** It is best to start cauliflower from transplants rather than seeds. Space the transplants 18 to 24 inches apart with 30 inches between rows. If starting by seeds plant seeds in rows 3 to 6 inches apart and ¼ to ½ of an inch deep.
- **Watering, fertilizer, and general care:** Cauliflower requires consistent soil moisture,
- **Harvest:** When heads are compact, white, and firm it is then time to harvest them. Ideally the heads will grow 6 to 8 inches in diameter. Follow fertilizing instructions on your brand of vegetable fertilizer, organic fertilizers recommended and fertilize every 4-6 weeks.
- **Companions:** Beans, Beets, Marigolds, Celery, and Potatoes.

Greens (Lettuces, Cabbages, Kale, etc...)

- **Planting:**
  - Leaf lettuce: Plant 4 inches apart.
  - Cos, loose-headed types and Kale: Plant 8 inches apart.
  - Firm-headed types: Plant 16 inches apart. Your rows of plants should be 12 to 15 inches across.
  - Cabbage: Plant 12 to 24 inches apart
  Cover the seeds with 1/4 to 1/2 inch of soil. Water thoroughly at time of transplant.
• **Watering, fertilizer, and general care:** Keep soil moist, mulching your garden will help to keep soil moist. It is recommended to fertilize after 3 weeks of planting (follow instructions of fertilizer if choose to do so).

• **Harvest:**
  - **Lettuces:** should be harvested when full sized but before maturity, Leaf lettuces can be harvested by simply removing outer leaves, so that center leaves can continue to grow.
  - **Cabbage:** Harvest heads when they have reached desired size and are firm. This will take about 70 days for most green varieties. After harvesting remove the entire stem and root system, to prevent disease build up.
  - **Kale:** Is ready to harvest when the leaves are about the size of your hands, pick about one fistful of leaves per harvest but avoid picking the center bud, this will help to keep the plant producing more kale.

• **Companions:** Onions, Garlic, Beans, Carrots, Beets

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**General Care for Your Winter Garden:**

**Soil:**

- The soil of your garden is very important, soil should be loose and soft.
- Add compost before each new planting season. Nutrients in the soil are taken up by the plants and it is important to replenish them in the soil. (best if done about a week before planting)
- If you are beginning a new garden you can still you use the natural soil from our area but amend it using a 2 or 3 part system. This will help to add the key nutrients your soil needs to produce health plants.
  - A 2 part system is to fill the bed with ½ of the natural soil and the other ½ with compost.
  - A 3 part system is to fill the bed with a 1/3 of the natural soil, a 1/3 compost, and a 1/3 potting soil.
Water:

- Deep watering is very important, try to keep soil moist to AT LEAST 6 inches at all times - test soil often to make sure it’s staying moist.
- Water early in the morning, before temperatures rise. If you miss this window of time, wait to water until it cools again in the evening.
- Use mulch such as alfalfa hay, newspaper, wood chips, pecan shells, or even gravel to help your soil conserve water (this prevents evaporation)
  - Just make sure to do this after your plants have grown up a little so they don’t become damaged.
  - If barrels will be staying outside, make sure to cover them with a screen or lid (when it’s not raining) to avoid debris contamination.

Suggested Reading:

- *Extreme Gardening* by Dave Owens “The Garden Guy”
  - This book is a great step-by-step guide for growing in the Sonoran Desert. Provides detailed information for various plants including best fertilizers, planting practices, pests to look for, and companion plants. It also provides general information about soils, fertilizers, organic pest control, and the best type of garden for your need. (We use this book all the time at TGK!)
- *The Tucson Garden Handbook* by the Pima County Master Gardeners
  - Provides general care and maintenance information for gardening in Tucson, also includes suggested varieties.

More Resources:


Pima County Cooperative Extensions Free Plant Clinic

(520) 626-5161

[https://extension.arizona.edu/free-plant-clinic](https://extension.arizona.edu/free-plant-clinic)
**Tucson Organic Gardeners Planting Guide**

*For Tucson and the Low Desert*

Jan 1 – Feb 15

**FROM SEED**

Arugula, Broccoli, Cabbage, Chinese Cabbage, Cauliflower, Celery, Cilantro, Collards, Dill, Fennel, Kale, Lettuce, Mustard Parsley, Bulb Onion (See Graphic), Potato

**FROM SEEDLING TRANSPLANT**

Artichoke, Broccoli, Cabbage, Chinese Cabbage, Cauliflower, Celery, Cilantro, Collards, Dill, Fennel, Kale, Lettuce, Mustard, Parsley, Spinach, Swiss Chard.

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April 15 – May 31

**FROM SEED**

Amaranth, Basil, Cantaloupe, Cowpea, Cucumber, Malabar Spinach, Melon, Okra, Sorghum, Sweet Potato Slips, Summer Squash, Watermelon

**FROM SEEDLING TRANSPLANT**

Basil, Eggplant, Pepper

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July 15 – August 31

**FROM SEED**

Bush Beans, Pole Beans, Corn (all types), Cowpea, Cucumber, Cantaloupe, I’itois Onion (See Graphic), Pumpkin, Sorghum Summer and Winter Squash

**FROM SEEDLING TRANSPLANT**

Tomato (July 15 - Aug 15)

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Oct 15 - Nov 15

**FROM SEED**

Beets, Carrots, Garlic, Greens, Lettuce, Mustard, Pea, Radish, Turnip, Wheat (December – January)

**FROM SEEDLING TRANSPLANT**

Broccoli, Cabbage, Chinese Cabbage, Cauliflower, Celery, Cilantro, Collards, Dill, Fennel, Kale, Lettuce, Mustard Parsley, Spinach, Swiss Chard

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**ONIONS**

“SHORT-DAY” BULB ONION SETS

January 1 – February 15

TOHONO O’ODHAM I’ITOIS MULTIPLIER ONION

July 15 – February 1

GREEN BUNCHING/SCALLION

August 15 – February 1

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## Companion Plants Chart

<table>
<thead>
<tr>
<th>Plant</th>
<th>Companions / Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparagus</td>
<td>Tomatoes, parsley, basil.</td>
</tr>
<tr>
<td>Basil</td>
<td>Tomatoes (improves growth and flavor); said to dislike rue: repels flies and mosquitoes.</td>
</tr>
<tr>
<td>Beans</td>
<td>Potatoes, carrots, cucumber, cauliflower, cabbage, summer savory, most other vegetables and herbs, &amp; around houseplants when set outside.</td>
</tr>
<tr>
<td>Beans (bush)</td>
<td>Sunflowers (beans like partial shade, sunflowers attract birds and bees), cucumbers (combination of heavy and light feeders), potatoes, corn, celery, summer savory.</td>
</tr>
<tr>
<td>Beets</td>
<td>Onions &amp; kohlrabi.</td>
</tr>
<tr>
<td>Borage</td>
<td>Tomatoes (attract bees, deters tomato worm, improves growth, &amp; flavor), squash, strawberries.</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Potatoes, celery, camomile, sage, thyme, mint rosemary, lavender, beet &amp; onions.</td>
</tr>
<tr>
<td>Carrots</td>
<td>Peas, lettuce, chives, onions, leeks, rosemary, sage &amp; tomatoes.</td>
</tr>
<tr>
<td>Catnip</td>
<td>Plant in borders; protects against flea beetles.</td>
</tr>
<tr>
<td>Celery</td>
<td>Leeks, tomatoes, bush beans, cauliflower &amp; cabbage.</td>
</tr>
<tr>
<td>Camomile</td>
<td>Cabbage &amp; onions.</td>
</tr>
<tr>
<td>Chervil</td>
<td>Radishes (improves growth and flavor).</td>
</tr>
<tr>
<td>Chives</td>
<td>Carrots; plant around base of fruit trees to discourage insects from climbing trunk.</td>
</tr>
<tr>
<td>Corn</td>
<td>Potatoes, peas, beans, cucumbers, pumpkin &amp; squash.</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>Beans, corn, peas, radishes, &amp; sunflower.</td>
</tr>
<tr>
<td>Dill</td>
<td>Cabbage (improves growth and health), carrots.</td>
</tr>
<tr>
<td>Eggplant</td>
<td>Bears.</td>
</tr>
<tr>
<td>Fennel</td>
<td>Most plants dislike it.</td>
</tr>
<tr>
<td>Flax</td>
<td>Carrots &amp; potatoes.</td>
</tr>
<tr>
<td>Garlic</td>
<td>Rose and raspberries (deters Japanese beetle); helps herbs with their production of essential oils, plant liberally throughout garden to deter pests.</td>
</tr>
<tr>
<td>Geraniums</td>
<td>Near grapes (discourages Japanese beetles).</td>
</tr>
<tr>
<td>Horseradish</td>
<td>Potatoes (deters potato beetle), around plum trees to discourage curculios.</td>
</tr>
<tr>
<td>Leek</td>
<td>Onions, celery &amp; carrots.</td>
</tr>
<tr>
<td>Marigolds</td>
<td>The workhorse of pest deterrents! Keeps soil free of nematodes; discourages many insects. Plant freely throughout the garden.</td>
</tr>
<tr>
<td>Marjoram</td>
<td>Here and there in garden.</td>
</tr>
<tr>
<td>Mint</td>
<td>Cabbage family &amp; tomatoes, deters cabbage moth.</td>
</tr>
<tr>
<td>Nasturtium</td>
<td>Tomatoes, radishes, cabbage, cucumbers; plant under fruit trees; deters aphids and pest of cucurbits.</td>
</tr>
<tr>
<td>Onion</td>
<td>Beets, strawberries, tomato, lettuce (protects against slugs), beans (protects against ants), summer savory.</td>
</tr>
<tr>
<td>Parsley</td>
<td>Tomato &amp; asparagus.</td>
</tr>
<tr>
<td>Peas</td>
<td>Squash (when squash follows peas up trellis); grows well with almost any vegetable; adds nitrogen to the soil.</td>
</tr>
<tr>
<td>Petunia</td>
<td>Protects beans, beneficial throughout the garden.</td>
</tr>
<tr>
<td>Pot Marigold</td>
<td>Helps tomato, but plant throughout garden as deterrent to asparagus beetle, tomato worm and many other garden pests.</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>Corn.</td>
</tr>
<tr>
<td>Radish</td>
<td>Peas, nasturtium, lettuce, cucumbers; as a general aid in repelling insects.</td>
</tr>
<tr>
<td>Rosemary</td>
<td>Carrots, beans, cabbage, sage; deters cabbage moth, bean beetles and carrot fly.</td>
</tr>
<tr>
<td>Sage</td>
<td>Rosemary, carrots, cabbage, peas &amp; beans; deters some insects.</td>
</tr>
<tr>
<td>Southernwood</td>
<td>Cabbage; plant here and there in garden.</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Grows with anything, helps everything.</td>
</tr>
<tr>
<td>Spinach</td>
<td>Strawberries.</td>
</tr>
<tr>
<td>Squash</td>
<td>Bean &amp; onions; deters bean beetles.</td>
</tr>
<tr>
<td>Strawberries</td>
<td>Bush beans, spinach, borage, lettuce (as border).</td>
</tr>
<tr>
<td>Summer</td>
<td>Beans, onions; deters bean beetles.</td>
</tr>
<tr>
<td>Savory</td>
<td>Bees.</td>
</tr>
<tr>
<td>Sunflower</td>
<td>Cucumbers.</td>
</tr>
<tr>
<td>Tansy</td>
<td>Plant under fruit trees; deters pest of roses and raspberries; deters flying insects; also Japanese beetles.</td>
</tr>
<tr>
<td>Thyme</td>
<td>Chives, onion, parsley, asparagus, marigold, nasturtium, carrots &amp; limas.</td>
</tr>
<tr>
<td>Turnip</td>
<td>Peas.</td>
</tr>
</tbody>
</table>

Combination of vegetables, herbs, flowers and weeds that are mutually beneficial, according to current reports compiled from Organic Gardening and Farming.
# School Calendar Plating Guide

## Tucson Region

### From Seed
- Green bean
- Sunflowers
- Chiltepin
- Amaranth
- 60 Day Corn

### From Starts
- Pepper
- Tomato
- Cucumber
- Summer squash
- Eggplant

### Winter Break
- From Seed
  - Swiss chard
  - Radishes
  - Beets
  - Carrots
  - Collards
- From Starts
  - Swiss chard
  - Radishes
  - Beets
  - Carrots
  - Onions
- From Seed (slips)
  - Green onions

### Summer Break
- From Seed
  - Radishes
- From Starts
  - Mint
  - Rosemary
  - Onions
  - Basil
  - Swiss Chard

### RECOMMENDED VARIETIES
- **Cabbage**: Copenhagen, Chinese
- **Cucumber**: Armenian, Dragon Egg
- **Eggplant**: Japanese
- **Garlic**: Silver Rose
- **Mellon**: NS/S Tohono O’Odham Yellow-Meated
- **Onion**: Southern Bell (Short Day varieties)
- **Squash**: Patty Pan, Golden Glory, Spaghetti, NS/S Black Beauty, NS/S Yellow Crookneck, NS/S Gray
- **Tomato**: Punta Banda, Yellow Pear

*NS/S = Native Seed Search

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**Plant Seedling Starts Indoors**

- **August**
  - Kale
  - Chard
  - Cabbage
  - Chinese cabbage
  - Collards

- **October**
  - Kale
  - Chard
  - Cabbage
  - Chinese cabbage

- **November**
  - Collards

- **December**
  - Tomatoes
  - Peppers

- **January**
  - Zucchini
  - Summer squash

- **February**
  - Cucumber

- **March**
- **April**
- **May**

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Passive water harvesting is the practice of slowing water down and encouraging it to soak into the ground. With simple land contouring (often called “earthworks”) that catch and direct stormwater runoff, stormwater can be used beneficially, encouraging plant growth in landscapes and natural areas, healing erosion cuts, and can even replace the need to irrigate with tap water.

Passive water harvesting systems consist of a catchment area, a distribution system and a landscape holding area. Runoff is directed from the catchment area to the holding area where water can be immediately used by landscape plants. Catchment areas include soil surfaces, roofs, roads and sidewalks. Passive water harvesting can be used along with a rainwater storage system (“active” rainwater harvesting) or can be used alone.

There are several advantages to this type of water harvesting:
- Inexpensive
- Simple to build
- Low maintenance
- Turns your land into a sponge!

Goals of passive water harvesting:
- **Slow** the runoff down
- **Spread** the water out
- **Soak** the water in

Use the following strategies to achieve the goals of passive water harvesting:

**Berms and Swales**, also known as mounds and dips, are created perpendicular to the flow of water. The ground is shallowly excavated outside the plant drip line to hold water, while the berm helps detain the water a while longer. Plant trees and shrubs in raised areas on or near the basin edge and do not allow water to stand around plant trunks or stems.

If using a berm with a swale, soil excavated from the swale can be used to build the berm. Berms can be constructed of soil, rock, straw bales, or other materials.

Create **infiltration basins**. These catchment areas include shallow basins or depressions, sunken beds (called “raingardens”) around plantings to supply water to several plants at once, or donut rings around individual plants. Hide these basins under mulch.
Consider permeable hardscape materials like porous pavement, un-mortared bricks or paving blocks with holes in them to prevent runoff and encourage penetration. Use impermeable surfaces to direct runoff to useful areas.

For sloped areas, build terraces. The multiple levels will slow runoff for plants and allow it to soak into the ground at each level.

Integrate earthworks by making them multi-functional. If a landscape is designed properly with berms, swales and the right plants, it can be a beautiful, natural landscape that relies solely on harvested rainwater.

**Dry streambeds** meandering through landscapes with rock “speed bumps” along the channel will slow runoff and encourage infiltration for use by nearby plants. Streambeds can have aesthetic value, creating a focal point in your landscape and provide the illusion of water.

Resources

UA Publications (http://cals.arizona.edu/pubs/):
- RainScapes, AZ1539
- Harvesting Rainwater for Landscape Use, AZ1344
- Rainwater Collection – Basic Components of a Rainwater Storage System, AZ1565

Additional resources: waterwise.arizona.edu
- Rainwater Collection – Calculating Water Supply and Demand to Estimate Storage Needs

References

Rainwater Harvesting for Drylands and Beyond, Vol. 2
B. Lancaster
Harvesting Rainwater for Landscape Use, P. Waterfall
Sonoran Permaculture Guild, Tucson, AZ.
Rainwater Management and Harvesting Principles

Detailed principles to help create your earthworks

START MANAGING WATER AT TOP OF WATERSHED
- Define the site “watershed” including off-site drainages that contribute to or receive runoff from your site
- Manage water at the top, and in small increments throughout the site to reduce the volume and force of water collecting at the bottom
- Work with upstream neighbors to encourage them to conduct water harvesting at their site, or capture their water as it enters your site and put it to use

CREATE MULTIPLE SUBWATERSHEDS
- Water is easier to manage at many small points than at one large point
- Where possible, use existing topography to create multiple small subwatersheds at your site to collect water
- Where natural topography isn’t sufficient, create multiple subwatersheds by altering land slope

SPREAD AND INFILTRATE THE WATER
- The least expensive place to store water is in the soil
- Channelized, silt-laden water has erosive power, so spread the water out at intervals to slow its flow and allow sediments to drop out of suspension
- Water that is spread out over soil has more places to infiltrate into the soil
- The more water that infiltrates into the soil, the less has to be managed as surface stormwater
- Water stored in the soil should be in locations where it supports vegetation

PREPARE FOR OVERFLOW
- In the desert southwest, there can be very heavy localized rains that cause extreme flooding
- Water harvesting structures that receive water from moderate to large catchment areas need to allow excess water to flow safely out
- Overflow devices need to be sized to handle extreme events and armored (e.g. lined with rock) to prevent erosion
- Overflow devices need to be maintained

MULCH TO REDUCE EVAPORATION
- Much of the water that sinks into soil is quickly evaporated in the hot season
- A layer of mulch will reduce evaporation causing the water to stay in the soil where it is available to support plants
- Mulch can be a 3-6 inch thick layer of organic material (bark, compost, straw) or 2 inch thick inorganic material (rock, gravel)
- Organic mulches help build soil as they decompose, and need to be renewed periodically
- Plants that drop their leaves help build organic mulches for themselves but may still need additional mulch
- If rock is already present at a site this might be a good source for inorganic mulches

PUT RAINWATER TO BENEFICIAL USE
- Think of the ways you use water at your site and figure out how you can use harvested rainwater for them
- Rainfall is low in salts compared to groundwater and plants grow better with rainwater than with groundwater
- Rainwater stored in soil is ideal for supporting plants

START SMALL AND ADJUST YOUR SYSTEMS AS NEEDED
- It’s best to try out ideas on a small scale first then adjust them as you see how they function when it rains
- Take the lessons you learn from small scale trials into larger scale systems when you are ready
- Inspect and maintain your systems regularly and especially after big rains

“You have to think like a beaver. If it doesn’t work just right the first time, go back and make it better.” Ben Lomeli

CREDITS
BEST Choices
- Your Own Saved Seeds
- Locally Grown Seeds
  - Open-Pollinated
  - Non-Hybrid
- Heirloom
- Organic
- Certified Naturally Grown
- Wild-crafted

Whenever possible, source your seeds first from the area where you live. Seed libraries, seed exchanges, and local seed companies that actually grow the seeds they sell are ideal choices.

Support genetically diverse, sustainable, small scale, bio-regional agriculture.

GOOD Alternatives
- Regionally Grown Seeds
  - Open-Pollinated
  - Non-Hybrid
  - Heirloom
  - Organic
  - Certified Naturally Grown
  - Wild-crafted
- Organic Hybrid Seeds

If the diversity you seek is not found locally, source your seeds from regional seed companies and seed exchanges outside your area. Look first to regions with similar climates and similar latitudes. Look for companies dedicated to genetic diversity.

AVOID
- Industrial (F1) Hybrid Seeds
- Treated Seeds
- GMO Seeds*
- “Big-Box” Seed Rack Seeds
- Industrially-Produced, “One-Size-Fits-All” Seeds from large corporate seed companies

*What about GMO?
GMO (genetically-modified organisms) seeds have been lab-engineered to contain genes from other life forms. For a list of seed companies pledging not to sell GMO seeds, visit:

www.councilforresponsiblegenetics.org
What About Certified Organic?
Certified organic seeds are great, but don’t sacrifice diversity by purchasing ONLY organic seeds. Over the last century, we’ve lost a large percentage of the world’s crop diversity. Many of the remaining rare, heirloom seeds are not yet available as organic seeds. Find them, grow them organically, save the seeds and in one season add another treasure to the world’s growing collection of organic seeds!

GLOSSARY OF TERMS

HEIRLOOM Treasures. Includes trusted, new, open-pollinated varieties as well as those passed down over generations.

HYBRID Also labeled (F1). Modern hybrids are produced by cross-pollinating two distinct, inbred parents. Difficult but not impossible for home gardeners to save their own seeds.

OPEN-POLLINATED Home gardeners’ best choice for seed saving. Produced through natural pollination without breeding controls.

ORGANIC A set of standards that eliminate or reduce chemical inputs. Regulated by the USDA National Organic Program. Still the consumer’s best bet for safety and health if they do not know the source of their food or seeds.

CERTIFIED NATURALLY GROWN A self-regulating, nonprofit agency upholding USDA organic standards.

SEED LIBRARIES Public places where seeds are deposited by a community for the benefit of the community. Participants check out seeds, grow them and return new seeds the following year. A resilient way to engender local diversity and seed security.

TREATED Seeds coated with a chemical fungicide or pesticide. Not allowed in organic gardens. These seeds can usually be identified by their fluorescent colors such as pink or blue.

WILD-CRAFTED Collected from wild plants growing in natural environments.

LEARN MORE
Join Native Seeds/SEARCH
Attend Seed School
Order more Seed Watch guides!

www.nativeseeds.org
Tucson, Arizona
520.622.0830

communityfoodbank.com