

# Mission Garden Essential Facts

## Introduction

Mission Garden is a project led by the Friends of Tucson's Birthplace (FOTB), a 501(c)3 non-profit organization. Mission Garden is just one part of the Tucson Origins Heritage Park (TOHP), the re-creation of Tucson's Birthplace at the base of Sentinel Peak ('A' Mountain). TOHP includes the Mission San Agustín, S-cuk Son Native Area, Carrillo House, and a Festival Area. Design and initial construction of TOHP was funded by Rio Nuevo (a special taxation district). FOTB advocates for building the entire park. The Friends of Tucson's Birthplace statement of mission and purpose is as follows:

Our mission is to preserve, honor, protect, restore, re-create and promote the cultural heritages and historic landscapes of Tucson's Birthplace at the foot of Sentinel Peak.

The mission statement for Mission Garden:

Mission Garden is a living agricultural museum of Sonoran Desert-adapted heritage fruit-trees, traditional local heirloom crops and edible native plants. We are a non-profit, volunteer-based educational organization. Our primary mission is to preserve, transmit and revive the region's rich agricultural heritage by growing garden plots representative of more than 4000 years of continuous cultivation in the Tucson Basin.

## History of the Site

- Paleo-Indian period 11,500? – 7500 BC  
Regional evidence but little direct evidence in Tucson for this period. Climate in the region was wetter and cooler than today. Small groups of people hunting game and gathering plants.<sup>1</sup>
- Archaic period 8500 – 2100 BC  
Climate became warmer and drier like it is today. Groups of people foraged seasonally over smaller territories. They continued to gather a variety of plants and hunt large and small game. People used grinding tools to process seeds for food.
- Early Agriculture period 2100 BC – AD 50  
People in the Tucson Basin began to cultivate maize, a domesticated corn that originated in Mesoamerica. They continued to eat wild resources. In time, people were living in substantial agricultural settlements in the Santa Cruz River floodplain. They built canal systems to water their fields. Dwellings were pithouses, and some settlements also had a larger pit structure that may have served some communal purpose.
- Early Ceramic period AD 50 – 500  
By this time people were using pottery regularly. They built more substantial buildings, and had become more sedentary, living in the same place most or all of the year. Dependence on crops increased—farmers had added beans, squash, cotton and agave. Population increased, canal systems expanded, and trade networks widened.
- Hohokam AD 500 – 1450

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<sup>1</sup> Tucson Underground: 4,000 Years of History. Archaeology Southwest Magazine, Vol. 32, No. 4.

- Hohokam Pre-classic period AD 500-1150  
Red-on-brown painted pottery became common. Villages had formalized courtyard groups organized into village segments, with roasting areas and cemeteries. Cremation became customary. At first, villages were along the Santa Cruz River. Around 750, people built larger villages along the river and its tributaries. Some villages had ball courts. After AD 950, settlements reached into the foothills. The largest villages remained on terraces above the Santa Cruz River.
- Hohokam Classic period AD 1150 – 1450  
Above ground adobe structures and platform mounds were added to villages, though ball courts were abandoned. There were special structures on the platforms where ceremonies may have happened. Agave cultivation appeared to reach its apex.
- Protohistoric period AD 1450 – 1692  
Hohokam cultural traits and construction disappeared. Smaller scale society predominated and left fewer traces than their predecessors. Residents of the area were probably the O’odham people who experienced the arrival of Spanish colonists in the 1690s (called Papago by the Spanish). Apache people also arrived in the area in the late 1600s.
- Spanish Colonial period AD 1692 – 1821
  - 1692– 1700. As part of the ongoing settlement of New Spain, Father Kino, a Jesuit, and other colonists encountered O’odham villages along the Santa Cruz River. They stretched from what is now San Xavier to the confluence with the Rillito. Kino founded missions at Bac (San Xavier) and at S-cuk Şon [ʃʉk ʃo:n]. Father Kino wrote down the name of the latter place as “Tucson.” It meant “black base” or “at the base of the black,” referring to the dark volcanic rock of Sentinel Peak (“A” Mountain). The mission at S-cuk Şon eventually became known as San Agustín.
  - 1700 – 1750. The early 1700s saw a series of priests living at San Xavier and visiting San Agustín. San Agustín was therefore called a *visita*. Population declined during this time, and Jesuit missionaries had little success. In 1751 the first chapel at San Agustín was built. Also in 1751 there was a Pima Uprising. In 1752, a Spanish presidio (fort) was built at Tubac. In 1757, Father Middendorf was resident at San Agustín for only a few months. He left because of malaria and Apache attacks.
  - 1750 – 1785. In 1767, Jesuits were expelled from New Spain. Franciscans replaced them at least at some locations. There were repeated Apache raids in the 1760s and 1770s. In 1775, the Anza expedition passed through the area. The same year the presidio at Tucson was founded, and the presidio at Tubac moved to Tucson in 1776. Construction of the presidio lasted from 1775 to 1777. Its location was on the east bank of the Santa Cruz River, in what’s now downtown Tucson.  
<https://tucsonpresidio.com/HistoryOriginalPresidio>
  - It’s not clear when construction began on the garden wall, but in 1770 “breastworks with gunports” were constructed, in 1771 a priest’s quarters was constructed, in 1772 the chapel was built, in 1773 a walled “mission house” was built, and in 1774 (or so) a granary was built. 1882 saw the biggest Apache attack on Tucson.
  - 1785 – 1800. Construction of church at Bac (which became San Xavier del Bac). 1790s saw construction surge at Mission San Agustín, with construction of the *casa conventual* (*convento*) and granary, and reconstruction of the chapel. Ak Chin Pimas and peaceable Apaches from Aravaipa settled in Tucson and helped with construction. The mission had

orchards, tanning vats, a soap factory, a blacksmith shop, and a smelter and *arrastra* (ore crusher) for processing ore. In 1797 the First Mission chapel in poor condition, new church started. After San Xavier was completed, workers “moved to San Agustín and built a two-story convento (a priest’s residence and possibly a trade school), a chapel, a granary, cemetery areas, and a surrounding compound wall.” In 1800 the second chapel was completed.

- 1800 – 1821. Early in this period, Tucson had 1,015 inhabitants and its residents produced 2,800 bushels of wheat, 3,500 cattle and 1,200 horses. More peaceful Apaches came to Tucson. At the end of this period, the region became a part of Mexico, after a protracted war that started with a revolt in central Mexico in 1810.
- Mexican Period 1821 – 1854
  - 1827 Spaniards (including Franciscan missionaries) expelled from Mexico
  - 1834 “Secularization” of all missions in Mexico (religious orders such as Franciscans were removed by the Mexican government)
  - 1846 Mormon Battalion passed through Tucson
  - 1852 John Russell Bartlett visits Tucson for US/Mexico Boundary Survey and paints the first image of Mission San Agustín.
  - 1846-48 Mexican American War results in much of northern Mexico becoming territories of the U.S., but not the Tucson area—border was at the Gila River.
  - 1854 Gadsden Purchase results in our region becoming a territory of the U.S.
- Territorial Period 1856 – 1912
  - 1856 Mexican troops leave presidio of Tucson
  - 1859-80 Catholic church re-established in Tucson
  - 1862 U.S. Army Major David Ferguson draws a map of Tucson agricultural fields, Mission, Mission Garden
  - 1866 US Army establishes Camp Lowell
  - 1869 Leopoldo Carrillo begins constructing house across Mission Lane using some of the convento building materials.
  - 1870 Tucson’s population is 3,000
  - 1875-99 Solomon Warner’s mill in operation
  - 1880s Treasure hunters loot the decaying convento building
  - 1887 Major earthquake in Sonora affects Tucson’s water table
  - 1889-90 Flooding into Sam Hughes’s canal starts downcutting of Santa Cruz River
  - 1890s Tucson Pressed Brick factory begins operations, digs “borrow pits” (excavations of clay soil used in bricks) near former Mission San Agustín
  - 1907 Transition to residential housing begins on the floodplain
- Statehood Period 1912 - current
  - 1930s Farming by Chinese gardeners, which had started in the 1870s, ends

- 1950 Last remains of the *convento* were bulldozed onto the landfill (trash dump) that was filling brick factory borrow pits at this time
- 1986 Neighborhood protest stops construction of road through mission site
- 1999 Rio Nuevo legislation approved by Tucson voters<sup>2</sup>  
 Voters approved the creation of the Rio Nuevo Multipurpose Facilities District. This was both a municipal stadium district and a special taxing district. The Rio Nuevo District allows the retention of a portion of the sales taxes normally collected in the District to be retained for use in the District, rather than going to the State. District purposes: a planned multi-faceted development project, including cultural and recreational amenities and improvements, unique historic re-creations, mixed-use developments, etc.
- 2000 – 2003 Initial archaeological work in the Mercado District, brickyard, mission and mission garden area
- 2003 Through Rio Nuevo funding, a group of consultants hired by the WLB Group created a conceptual plan for Tucson Origins Heritage Park.
- 2006-8 Final plan, including building blueprints, etc., was created by a team under consultant Burns Wald-Hopkins Shambach Architects. The park included rebuilding S-cuk Şon (Native American village), Mission San Agustin, Mission Garden, Carrillo House and other interpretive areas.
- 2006-08 Based on newly approved masterplan, Desert Archaeology did additional excavations to clear for construction, including at the Mission Garden and Mission sites.
- 2007-08 Interpretive plans for Tucson Origins Heritage Park developed.
- 2008 Construction on the Mission site begins with removal of the landfill and installation of underground utilities. Construction of Mission Garden begins, Construction stops in 2008 due to the economic downturn. Garden was graded, walls and exhibit building were built, but there was no water or landscaping.
- 2009 – 11 The garden sat empty as a group of long-time advocates for the park formed the non-profit FOTB. FOTB got permission to operate the garden, and they raised funds to further develop it.
- 2011 FOTB and Pima County enter 5-year development, operations, and maintenance agreement. The garden receives its first Arizona State Forestry Grant. First volunteer work on cleaning orchard. Water lines enter garden.
- 2012 Irrigation was installed, and planting of the orchard and vineyard was started with Kino Heritage Fruit Trees and grapes in what is now called the Spanish Colonial Orchard. Some ramadas were built, and the first plantings went into the Spanish Colonial Vegetable Garden. Some native trees were planted in the Timeline Garden area. Soil was amended in the Early Agriculture and Hohokam garden areas.

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<sup>2</sup> Rio Nuevo Website, <https://rionuevo.org/>

- 2013 First plantings go in in the Early Agriculture and Hohokam areas. Native plants planted in Z's Garden (native plant garden—name explained below). Grants from Arizona Forestry Department and the Tohono O'odham helped fund early plantings.
- 2015 Rio Nuevo funds \$1.1M for completion of Mission Garden.
- 2016 Tarahumara Granary and Chicken Coop assembled. They had been bought in 1978 by the Arizona State Museum for an exhibit on the Tarahumara, and then stored in the State Museum's basement. In August construction began on the Education Building (the one by the service entrance) and the Kitchen building. (The Exhibit Room walls, the building in the wall by the visitor gate, was built in 2008 when the wall was built, and the roof installed by volunteers in 2012.)
- 2017 FOTB and Pima County extend their Operating Agreement for an additional five years. Construction of buildings completed in February.
- 2018 Kitchen outfitted and complete, begins to be used.
- 2019 Acequia construction complete and it is filled with water in April.

## Sections and Features of the Garden

This information can be used in tours and when greeting the public. A separate document will have a list of crops produced in each garden area.

### Front Path and Entrance

- Native vegetation along path from visitor parking to front entrance includes wolfberry (*Lycium* sp.), Arizona ash (*Fraxinus velutina*), netleaf hackberry (*Celtis reticulata*), desert hackberry (*Celtis pallida*), deergrass (*Muhlenbergia rigens*), mesquite (*Prosopis velutina*), and others.
- Note the sign on the right just after you walk over the bridge.
- Agaves are planted on the slope to the left (east) in *trincheras* (terraces) to mimic plantings of the Trincheras Culture, which had mountaintop villages (including Tumamoc Hill) overlapping in time with the Hohokam.<sup>3</sup> The slope is part of the cover over the landfill.

### General Information at the Front Gate

- Mission Garden is the rebuilt, walled, four-acre garden that is in the same location as the original garden was in the latter part of the Spanish Colonial Period.
- According to Google Earth, our current garden is about 3.5 acres—the original garden was about 4 acres and extended farther west and north. The re-created adobe walls are offset from the original location to avoid damaging the existing original foundation stones.
- The garden is a living museum of 4,100 years of agriculture in Tucson. This is the longest known, or at least one of the longest known, period of continuous cultivation in the United States.
- We have the oldest known canal-irrigated agriculture in the United States (starting at least 3,500 years ago).
- Stormwater wash alongside path.
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<sup>3</sup> Archaeology Southwest, Trincheras Culture, <https://www.archaeologysouthwest.org/ancient-cultures/trincheras/>

## Exhibit Room

- Artist's rendition of view from Sentinel Peak or "A" Mountain
  - It was painted by Paul Mirocha based on virtual archaeological work done by Doug Gann
  - It is what Tucson would have looked like in about 1810.
  - This shows the natural resource (water, floodplain soil) upon which Tucson grew.
- Watkins photo from 1880
  - First photograph of abandoned Mission Garden and Mission San Agustín as they deteriorated.
  - Shows floodplain intact
  - Shows train (railroad entered Tucson in 1880)
- Show visitors the model of the Mission San Agustín (it was about 200 yards east, and a bit north, of the garden)
- When greeting people, give them a brochure and ask them to sign in. If they'd like to get our monthly email updates, then can put down their email. If they want to volunteer, have them check the final column and include their phone number.

## Spanish Orchard, Vineyard, Garden, and Fields

- This part of the garden is meant to look like it did during the period when Spanish missionaries and other colonists were here.

## Orchard

- Kino Heritage Fruit Trees: Propagated from cuttings gathered from heritage trees around the southwest and Baja California by the Desert Museum's Kino Heritage Fruit Tree Project. They are presumed to be the same varieties brought by Spanish missionaries, and maybe the same genetic composition because many of the trees, and the grapes, were reproduced and grown by rooting cuttings (propagation or cloning). We hope for future DNA studies to confirm the historic status of these trees.
- The orchard is pruned in the winter to decrease the woody mass of the trees, so it sets more fruit, to shape the tree, and to have cuttings for rooting new trees. Less pruning is done here than in commercial orchards—more in the style of traditional Sonoran orchards. We don't know exactly what the garden and trees looked like in the original Mission Garden, but we use traditional Sonoran orchards of today as a model.
- Trees of many species grow mixed together in the orchard, also in the Sonoran style

## Vegetable and Herb Garden

- Contains summer season and winter season crops brought from Europe
- Sugar cane is from South Asia. It would have been used to sweeten products made from quince and Seville orange.
- The herb garden plants are based on sources that indicate what culinary and medicinal herbs would likely have been grown at the garden.<sup>4</sup>

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<sup>4</sup> E.g., J Soule (2011) *Father Kino's Herbs: Growing and Using Them Today*

## Vineyard

- There are three types of grapes growing here: Mission grapes, white concord grapes, and wild canyon grape. The mission grapes were grown from cuttings from the UC Davis Grape Vine Repository in California, and at a mission in San Borja in Baja California. The white concord grapes are from cuttings from a vine at Capitol Reef National Monument in Utah.
- Each is grown in two traditional styles: arbor and goblet (free standing). The latter is said to be more historically accurate and good for areas prone to drought.

## Field Crops

- Field crops also contain grain and vegetable crops brought by missionaries and Spanish colonists.
  - White Sonora Wheat, an early heritage variety brought by the Spanish, is grown here and harvested at the San Ysidro Festival<sup>5</sup>
- **Community Collaborators:** Re-enactors from the Tucson Presidio (*soldados, gente*) help to interpret this period during the San Ysidro Festival in May.

## Orchard Extension

- Additional kinds of trees that were brought in Spanish period or later (Valencia orange, Meyer lemon, loquat, peach, apple, grapefruit, mulberry)
- These trees were planted in 2015-2017
- A tree here was dedicated to Father Kino by Friends of Tucson's Birthplace as part of Mission Garden's Tree Steward Program. Italian relatives of Father Kino have visited the garden and this tree.

## Toilets and Commercial Kitchen

- This building was built between summer 2016 and early 2017
- Commercial kitchen helps us have culinary demonstrations and prepare food for festivals
- Foundation in front for reconstruction of the "gardener's hut" that was historically on the north wall of the Garden.
- **Community Collaborators:** Among funders of our commercial kitchen was Slow Food Southern Arizona<sup>6</sup>

## Early Agriculture Garden, 2,000 – 4,000 years ago

- Archaeologists believe the earliest farmers planted early varieties of corn, beans and squash.
- We grow wild native ancestors of early cultivars, like coyote gourd (cushaw squash), chiltepin (ancestor of chilies and peppers), gourds, wild tepary beans,<sup>7</sup> and wild devil's claw
- The corn growing here is usually chapalote, a genetically primitive corn more like the earliest corn in Tucson than other kinds (available Native Seeds/SEARCH)<sup>8</sup>
- Note flood irrigation of beds; water would have come in canals

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<sup>5</sup> Gary Nabhan, Heirloom Gardener, Fall 2012, <https://www.heirloomgardener.com/plant-profiles/edible/rise-white-sonora-wheat-zmaz12fzfs>

<sup>6</sup> <https://www.slowfoodsouthernaz.org/>

<sup>7</sup> Wikipedia, *Phaseolus acutifolius*, March 2019, [https://en.wikipedia.org/wiki/Phaseolus\\_acutifolius](https://en.wikipedia.org/wiki/Phaseolus_acutifolius)

<sup>8</sup> Gary Nabhan, Heirloom Gardeners, Winter 2012-13, <https://www.garynabhan.com/news/2013/01/chapalote-corn-the-oldest-corn-in-north-america-pops-back-up/>

- We have the earliest known canals in the U.S. (starting 3,500 years ago)
- **Community Collaborators:** Archaeology Southwest is helping interpret this period by building a Cienega Phase pithouse in the Children’s Garden. Native Seed/SEARCH provided the initial seeds for the early gardens.

### Hohokam Garden, AD 500 – 1450

- Archaeologists believe Hohokam farmers planted cotton as well as corn, beans and squash.
- Our plants are varieties, often from Native Seeds/SEARCH, like those that would have been planted in this era.
- Similar canals, flood irrigation
- Also demonstrates Ak-Chin irrigation, planting at the outlet of washes to get summer rain runoff

### Agave Plantation and Roasting Pit

- Agaves were used for food and the agave fibers used for fabric & rope.
- While agave juice was fermented in other areas, we have no direct evidence this was done here
- Agaves used for thousands of years but Hohokam especially grew it a lot
- Native American roasting pits were more bowl-shaped; ours a more modern Sonoran design
- **Community Collaborators:** Our roasting pit is the focus of our events for Tucson’s Agave Heritage Festival<sup>9</sup>

### Tohono O’odham Pre-contact Garden

- Native Americans had only warm-season crops prior to arrival of Spanish
- Some crops were developed in central Mexico (corns, beans, squash); others were developed locally (teparty beans, devil’s claw, panic grass)
- **Community Collaborators:** O’odham people come and help plant crops in the spring

### Tohono O’odham Post-contact Garden

- Mixture of Native American crops and those brought by Spanish
- Some of crops brought by Spanish can be grown in winter (wheat, leafy greens, onions, etc.)
- Demonstrates agricultural methods introduced by Europeans such as steel plows and planting in furrows.

### Z’s Garden, Native Sonoran Desert Plants

- Wild Sonoran Desert plants used for food, medicine, fiber, and construction
- Named after Nancy Zierenberg, a native plant enthusiast and environmental activist<sup>10</sup>
- **Community Collaborators:** The Arizona Native Plant Society help plant and maintain this garden

### Mexican Garden

- Interprets period of 1821 (end of Mexican Revolution) to 1854 when this area became a territory of the U.S.

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<sup>9</sup> Agave Heritage Festival, home page, <https://www.agaveheritagefestival.com/>

<sup>10</sup> Arizona Daily Star obituary, [https://tucson.com/lifestyles/faith-and-values/life-stories-environmental-activist-lived-life-in-support-of-all/article\\_0fad9f9d-773a-568a-b4a9-dc29d498b3c6.html](https://tucson.com/lifestyles/faith-and-values/life-stories-environmental-activist-lived-life-in-support-of-all/article_0fad9f9d-773a-568a-b4a9-dc29d498b3c6.html)

- Replicates a Mexican-era rancheria (small farming community) mixing Old World and New World plants, including ornamentals and tropical plants

### Michael Moore Native Medicinal Herb Garden

- Wild medicinal plants native to the Southwest
- Michael Moore researched medicinal herbs and wrote books about them<sup>11</sup>
- We print and sell a booklet describing the plants in this garden
- **Community Collaborators:** The Tucson Herbalist Collective helps maintain and interpret this garden; Donna Chesner, of the collective, helped design and plant the garden.

### Chinese Garden

- In the 19<sup>th</sup> century, Chinese people were working in the Western US on mines, railroads, and other industries<sup>12</sup>
- Some Chinese workers settled in Tucson in the late 1800s and early 1900s. Many of the local farmers were Chinese. They leased farmland from landowners like Leopoldo Carrillo.
- This garden demonstrates Chinese specialty crops grown in backyard gardens for cuisine and medicine.
- Chinese farmers also planted produce for sale to European settlers in the pueblo of Tucson
- **Community Collaborators:** Volunteers from the Tucson Chinese Cultural Center help plant and maintain this garden and distribute its produce.

### Children's Garden

- School children who visit the garden get to plant, mulch and harvest, and learn about soils here.
- The garden has a replica of a Cienega Phase (Early Agriculture Period) pithouse—a kind of house that would have been built between 800 BC and AD 50<sup>13</sup>
- With help from botanical illustrators, we are working on a Mission Garden coloring book for kids
- **Community Collaborator:** Archaeology Southwest, which is helping to build the pithouse here

### Anglo Agriculture (Territorial and Statehood periods)

- Under development, fundraising
- Garden area might focus on citrus and cotton, two of the five “Cs” of the Arizona economy (the other three are cattle, copper and climate)

### Tarahumara Chicken Coop and Granary

- In 1978, the Arizona State Museum purchased these structures from an abandoned Tarahumara village in the Sierra Madre Occidental near Copper Canyon, Chihuahua. They were brought to Tucson for an exhibit on the Tarahumara, and then stored.
- The Tarahumara Granary was reassembled in the Garden in 2016 and the Chicken Coop was reassembled in 2017

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<sup>11</sup> Wikipedia, Michael Moore (Herbalist), [https://en.wikipedia.org/wiki/Michael\\_Moore\\_\(herbalist\)](https://en.wikipedia.org/wiki/Michael_Moore_(herbalist)), and, e.g., Michael Moore, 1989, *Medicinal Plants of the Desert and Canyon West*, Museum of New Mexico Press.

<sup>12</sup> Tucson Chinese Cultural Center, <http://www.tucsonchinese.org/chinese-history-tucson/>

<sup>13</sup> Desert Archaeology, The Early Agricultural Period Construction Boom, <https://desert.com/early-agricultural-construction/>

- The wood has been cored and the tree rings studied by the UA Tree Ring Laboratory. They started growing around 1680 and were harvested around 1920, so the structures were probably built in the 1920s.
- **Community Collaborator:** The Arizona State Museum donated these items to the garden.

### Yoeme (Yaqui) Garden

- Under development, fundraising
- Yoeme people were forced out of their homelands by war and some came to the southwest US
- Our Yoeme garden is under design and development

### African American Garden

- Under development, fundraising
- **Community Collaborator:** We are developing a relationship with the Dunbar Center in the historically African-American Dunbar/Spring Neighborhood to help design this garden.

### Acequia (canal)

*Acequia* is the Spanish word for a canal for irrigating crops. Garden staff and Board of Directors tend to use the word *acequia* rather than the word canal, but they can be used interchangeably. Of course, canals before the Spanish Colonial Period would not have been called acequias. The *acequia* in the garden is not used for irrigation. Instead, it brings back the ambience of the irrigated Santa Cruz River floodplain, which has had irrigation canals for 3,500 years or more. At the south end of the canal is a mock wetland, meant to look a bit like the wetland that was ½-mile south of the garden, from which many of the canals emerged. The south end of the canal is meant to look like a Spanish colonial-era *acequia*. From there, it flows into a pond in the middle of the garden, and then into a canal that is meant to look like a prehistoric canal, as it flows by the O’odham, Hohokam and Early Agriculture gardens. At the bottom a pump recirculates water back to the south end of the canal.

The *acequia* was designed to contain rare species of fish, frogs and turtles, potentially including desert pupfish, Gila topminnow, a species of sucker, lowland leopard frog, and a turtle. In July 2019, 500 Gila topminnows were introduced into the canal. Having these rare species in the garden requires collaboration with U.S. Fish and Wildlife Service, Arizona Game and Fish Department, and Pima County’s Office of Sustainability and Conservation.

The acequia also contains wetland and aquatic plants that help provide food for fish and aquatic invertebrates, and which help purify the canal water. One plant in the acequia is an endangered species: Huachuca water umbel (*Lilaeopsis schaffneriana*).<sup>14</sup> We were able to have this plant in the garden through collaboration between Pima County Natural Resources Parks and Recreation, the Pima County Native Plant Nursery, and Arizona Game and Fish Department.

### Tomorrow’s Garden

- Under development, and pending fundraising
- Garden will experiment with techniques, technologies, and varieties that may work going forward

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<sup>14</sup> U.S. Fish and Wildlife Service, Environmental Conservation Online System, <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=Q2PK>

- A concept design for Tomorrow's Garden was ~~done~~ prepared by garden intern Brad Kindler while he was a masters student in landscape architecture at the University of Arizona. The design is in a document available in our Google Docs collection.

## Frequently Asked Questions

### What do we do with all the produce we grow?

1. We sell some of it to restaurants, or to companies that supply restaurants.
2. We give some of it to our volunteers.
3. We make things out of it, especially for special events. This has included preserves, soups and special meals.
4. Iskashitaa, the refugee resettlement network, gleans some of our crops and makes products out of them to sell.
5. Garden Volunteers are allowed to take some of the produce.
6. Kino Heritage Fruit Tree Stewards are allowed to take fruit from their trees.

### What is your source of water for irrigation and for the acequia?

All our water is potable water supplied by Tucson Water. The garden has two water hook-ups, each with a water meter. One is for our potable water supply and the other is for irrigation. They are separate because some day we would like to hook the irrigation meter to the reclaimed water system (highly treated wastewater). Reclaimed water would not be used for produce, only for trees or native plants. There are two barriers to using reclaimed water currently. One is that the reclaimed water lines don't come close enough to the garden yet to connect to them. Another is that although reclaimed water is less expensive than regular potable water (incentivizing its use), the garden currently pays an agricultural water rate, which is lower than the rate for reclaimed water!

### Does the garden do any rainwater harvesting?

The raised, Americans with Disabilities Act (ADA)-compliant, pathways around the garden, result in rainwater staying in the lower garden bed areas. We have considered cisterns to collect water off of roofs but have not funded this yet.

### What does the solar panel on the east side of the garden do?

It was designed to charge a battery that ran irrigation timers, before electricity was available in the garden. The irrigation timers have since been moved and hooked up to the regular electrical supply.

## Annual Round of Events at Mission Garden

### January

- Winter crops: If not planted already by now, we are often planting winter garden crops such as Sonoran white wheat, lentils, favas, lettuce, garbanzos and many others. These are planted in the Spanish Garden and the Post-contact Tohono O'odham Garden.
- Many of the citrus trees have harvestable fruit.
- Deciduous trees are dormant
- Volunteer appreciation event

## February

- In late January, and February, deciduous trees and grape vines are leafless and dormant. This is the time when it is best to prune them. We have our annual pruning and propagation class.
- Pruning is done for several reasons. One is to decrease the woody mass of the tree so that it puts more energy into blooming and setting fruit. Another is to shape the tree in any way that is desirable, whether to thin it to reduce potential wind damage or prune up low branches so that when the tree is bigger you can walk under it. Pruning in the Mission Garden has followed practices found in heritage orchards in Sonora, which is to prune less than is generally the case in commercial orchards.
- Pruning is also done so that new trees can be propagated from the cuttings. Cuttings should be of acceptable diameters and lengths for propagation. The cuttings are placed in pots with potting soil or sometimes right in the ground. Rooting hormones can be used to stimulate growth, or there are also traditional products believed to promote root growth that can be used such as aloe vera and lentils.
- Field trips for local schools are scheduled so students can take part in tree propagation workshops.
- Sprouts appear on Figs, Apricots, Sweet Mexican Limes, Willows
- **Special Event:** Around the end of January or early February the garden normally holds a propagation workshop. Attendees can learn how to prune and propagate grapes, figs, pomegranates, and quinces. We plan to add classes on grafting and other gardening topics.

## March

- Weather is warming. Many of the winter crops are producing.
- By March 15, the likelihood of freezing temperatures is lower and spring crops, some of which might be sensitive to frost, are planted.
- Citrus & Stone Fruit trees start blossoming.

## April

- Winter crops continue to be harvested and some are left in the field to produce seed for next year's crops.
- Planting of spring/summer crops continues.
- **Special Events**
  - Agave Heritage Festival: In late April Mission Garden holds an agave roasting event as part of the city-wide *Agave Heritage Festival*. Agaves are roasted in a pit oven the day before and removed during the festival. Attendees learn about prehistoric growing and uses of agave, especially by the Hohokam. They get to sample the roasted agave, as well as different kinds of mescal (including tequila), which are made from agaves in Mexico. Attendees also get a lesson on how to roast agave in their own ovens at home.
  - Trip to Sonora: Often in spring there is a trip to Sonora led by FOTB board members or staff. This trip visits traditional orchards and farms in the state of Sonora, and other important historic and cultural sites and activities.

## May

- Winter crops continue to be harvested. Some are left in the field to produce seed for next year's crops. Planting of spring/summer crops continues.
- Stone fruits ripen and ready to harvest
- **Special Event: San Isidro Festival.** This is the traditional festival for the wheat harvest. Since Spanish colonists brought wheat to our region, there has been a festival on the saint's day for San Ysidro (Saint Isidore), the patron saint of laborers and farmers. This date corresponded to the time, mid-May, when the wheat is ready to harvest (it is planted in November). There is a procession through the garden with a wooden statue of Saint Isidore and a priest blessing the gardens. During the festival, horses' hooves are used to thresh (separate wheat grains from wheat heads). Traditional winnowing methods are demonstrated. Our traditional mill stones are used to mill some of the wheat into flour onsite. Attendees get to sample *pozole de trigo*, or wheat pozole. This is a traditional soup made with swollen wheat kernels, rather than the hominy used in most pozoles.

## June

- June weather is our hottest and driest. Much of the garden work during this time consists of making sure that plants and trees are adequately watered.
- At the end of June, traditional Dia de San Juan ceremonies are held to encourage the summer rains to come. In modern times, the average onset of Tucson's monsoons is around July 4.
- Figs are ripe

## July

- Figs continue to ripen.
- Summer rains in July and August can come on quickly and result in large rainfall events. Surface water runoff is 'harvested' and directed to the low-lying garden plots. The continued amendment of soil and the growth of roots into the soil, particularly in the orchards, has made the ground more permeable, or absorbent, in events such as these.
- Where the acequia flows past the O'odham garden, there is a *canoα*. This is a hollowed log (ours is concrete made to look like wood) that carries canal water over a low spot. Ours carries water over a low spot that can act as an overflow for stormwater building up in the O'odham garden. The overflow will go into the Orchard Extension.
- Plant Corn, Beans, & Squash in Early Agriculture & Hohokam basins
- Summer vegetables emerge

## August

- Many summer crops are producing.
- **Special Event: Tucson's Birthday.** Los Decendientes and the Tucson Presidio celebrate the founding of the Tucson Presidio in August 1775 as the birthday of Tucson.
- FOTB celebrates the full 4,000-plus years of agriculture in the Tucson area.-Therefore, Mission Garden's event in August de-emphasizes the traditional birthday and emphasizes an ongoing 4,000-year tradition and Tucson's birthplace.
- Pomegranate harvest begins.

## September

- Summer crops are producing, and pomegranates ripen.
- **Special Event:** Pomegranate Festival. This festival celebrates the pomegranate harvest and while it was held at the garden once, it usually is held at a different site with pomegranates each year.
- In 2019 there was no festival but we celebrated Pomegranate Month at the Garden.

## October

- Summer crops are being harvested, like squash and winter melon. Quinces ripen. A variety of products are made from quince, including preserves and quince paste (*cajeta de membrillo*, *dulce de membrillo*).
- **Special Events:**
  - *Membrillo* Fest (Quince Festival). In this festival in late October, we celebrate the quince harvest. Attendees get to see the process of making *Cajeta* or *Dulce de Membrillo* (quince paste). A variety of garden products, including quince paste and preserves, are on sale.
  - Oaxaca trip. Attendees have a variety of archaeological, historical and cultural experiences in the southern Mexican state of Oaxaca.
  - It's likely there will continue to be a fall harvest dinner featuring produce from the garden.

## November

- Most deciduous fruit trees have lost their leaves.
- Citrus trees may be ready to harvest
- Most summer crops have been harvested, except perhaps some gourds drying in the fields.
- Summer crops are often removed at this time and winter crops planted, such as white Sonora wheat.
- Harvest seed corn
- **Special Event:** Sonora Trip. Often there is another trip to Sonora this time of year. Led by FOTB board or staff, this trip visits traditional orchards and farms in the state of Sonora, and other important historic and cultural sites and activities.

## December

- Some citrus trees may be ready to harvest
- Mexican sweet limes ripen

## Related Organizations and Efforts

### Santa Cruz Valley Heritage Area

Beginning in 2003, there was an effort to have the US Congress designate the Santa Cruz River Valley, from the Mexican Border to the Pima-Pinal County line, as a National Heritage Area. "*National Heritage Area* is a new federal designation that recognizes the defining landscapes and regional cultural traditions

of the United States, and helps preserve nationally important resources through the creation of partnerships among federal, state, and local entities.”<sup>15</sup>

The Center for Desert Archaeology (now Archaeology Southwest) shepherded the effort and finished a Feasibility Study in 2005.<sup>16</sup> In March of 2019, congress approved, and President Trump signed into law, the John D. Dingell, Jr. Conservation, Management, and Recreation Act (S.47), which included the Santa Cruz Valley National Heritage Area Act.

A non-profit entity, The Santa Cruz Valley Heritage Alliance,<sup>17</sup> promotes the heritage area.

### Tucson City of Gastronomy

The United Nations Education, Science and Culture Organization (UNESCO) started its Creative Cities Network in 2004. The field of gastronomy was added to the designations in this network in 2005. In December 2015, Tucson was named the first City of Gastronomy in the United States. Mission Garden was part of the suite of institutions and characteristics that contributed to Tucson’s designation. A non-profit organization, Tucson City of Gastronomy, was formed to promote Tucson’s gastronomic status and excellence.<sup>18</sup>

### Presidio de Tucson

The Tucson *presidio* (Spanish fort) was founded in 1775 in what is now a part of downtown Tucson. In the years to follow the fort was built and soldiers that had been at the presidio in Tubac were moved to Tucson.

In the early 2000s archaeologists excavated the remains of the northeast corner of the fort under a parking lot on Church St. This corner of the fort subsequently was rebuilt and is now a major historical attraction. Volunteers from the *presidio* attend the San Ysidro Festival in the garden in May and periodically garden volunteers participate in events at the *presidio*.<sup>19</sup>

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