

The Basic Who, What, Where, When, Why and How of Planting and Caring for a Heritage Fruit Tree in the Sonoran Desert



FORMER UA ARBORETUM DIRECTOR LIBBY DAVISON HELPING PLANT THE ORCHARD AT MISSION GARDEN

Many people like to grow fruit trees that remind them of their grandmothers or grandfathers, or that connect them to the region's cultural, culinary and agricultural history.

These fruit trees include different varieties and cultivars of pomegranates, figs, quinces, several species of citrus, apricots, grapevines, mulberries, olives, peaches, loquats, jujubes.

Elevation, soil type and exposure are important factors to consider when planting trees. Irrigation and soil amendment requirements are very different for trees planted in the rich clay loam soils of the floodplains and the rocky slopes of the foothills.

If you want a shade tree think of the arc of the sun at different times of the year and calculate where the shadows will be. Leave plenty of space for the tree to grow to its full potential, above and below the ground.

Dig a hole as deep as the root ball of the tree, and at least a foot wider than the root ball all around. Fill the hole with water and let it drain out, both to wet the soil and to make sure there is good drainage. Remove the tree from the pot and place it in the hole. The base of the tree trunk should be just above the ground level so that it does not remain underwater during irrigations or heavy rains. It should be "high and dry". Use the native soil, mixed with a small amount of soil sulphur (follow

instructions on packaging for precise amounts), to fill the hole. Pack tightly, and create a ring-shaped well—a slight dip—around the drip line (the edge of the canopy) so that irrigation water will soak down to the roots (you don't need to water the trunk). Top-dress the soil above the roots with a two-inch layer of compost mixed with organic fertilizer, and cover with two inches of organic mulch, always leaving the trunks and root crowns clear and dry. Water well and often for the first few months, which means slow and deep, as opposed to fast and shallow. Hoses or irrigation lines should be placed in the sunken band around the tree under the drip line.

You can plant anytime, but in the summer a newly planted tree will need to be watered often and deeply. Protection with shade-cloth might also be necessary. It is easier to get a tree established in the early fall or early spring, when temperatures are milder. Frequency of irrigation will depend on the size of the tree, the depth of the roots, and the temperatures. The soil around the roots should be damp, but not drenched.

Pomegranate trees are actually shrubs. They can be pruned to form a single, or multiple stemmed tree but they will inevitably send out abundant water sprouts, and their flexible boughs will bend down to the ground, as bushiness is their true nature. Pomegranates tolerate extreme heat, drought, alkaline soils, moderate frosts and an inordinate amount of neglect. However, for good fruit production in the Sonoran Desert they require consistent and abundant irrigation.

The most common pest is the leaf-footed bug (*Leptoglossus phyllopus*), which has infested the Mission Garden orchard and spoiled significant portions of our crops. We refrain from using synthetic pesticides, but we have tried applying neem oil to defoliated trees in the winter, and even using a shop vacuum to suck the bugs off our fruit! These methods did lessen their numbers to some extent. This year we are looking forward to experimenting with spraying the trees with fermented leaf-footed bug juice, as we have learned this was a traditional horticultural pest control remedy. Over time, we hope their natural predators, including assassin bugs, spiders and birds, will increasingly keep their numbers in check. It's important to remove cracked and damaged fruit from the tree and ground, as the nymphs thrive inside them.

Fig. Spreading, oval shaped, shrubby deciduous trees, figs grow one to two feet per year, to 40 feet tall and wide. They grow both in full sun or partial shade. "Fruits" are actually receptacles containing flowers. The pollinator fig wasp is absent in America, but most cultivars are parthenocarpic (fruit develops without pollination). Trees are easily propagated from cuttings.

Tolerant of heat and alkaline soils, as long as they get plenty of water, figs are well adapted to the Sonoran Desert. The Black Mission Fig is the most well-known and widely grown variety in the Tucson Basin.

Quince. These small deciduous trees of the rose family grow very well in the Sonoran Desert region. They are heat and frost tolerant, but do require regular and abundant irrigation, and fertile soil. They leaf out and bloom in early spring, with bright green, fuzzy leaves and pinkish white blossoms. Rather more like shrubs than trees, in this region it has been traditional to leave from six to nine main stems, although quinces can also be reduced to a single stem and formed into a more typical tree shape. In either case, however, they tend to produce numerous water sprouts,

some of which are typically used for vegetative propagation. In our soils, they often become chlorotic—the leaves turn yellow and veins remain green—in which case it is recommended to treat soil, and/or apply a foliar spray with chelated iron.

Citrus. There are twenty-eight genera of citrus. Varieties cross within genera as well as species. Hybrids are often fertile, too. Citrus can be both self-pollinating and “parthenocarpic” (able to produce fruit and fertile seed without sexual mixing). New varieties often appear as chance mutants, as well. Citrus is not ‘true to seed’ so vegetative propagation or grafting is necessary to breed specific varieties.

Citrus are evergreen trees, with white or pinkish white flowers. Apart from delicious fruit that provides vitamin C right when the weather gets cold and it is most needed, they are revered for their shade and decorative form, beautiful flowers and delicious aromas.

Our native desert soil is alkaline, with a PH of about 8, and citrus thrives in soils with a PH closer to 6.5. To increase its acidity, many local gardeners top-dress the soil under the canopies with spent coffee grounds.

Watering too frequently is a common problem for local gardeners growing citrus trees. It’s best to let the soil around the root systems “dry out” between irrigations. For established citrus trees, regular deep irrigation at weekly intervals in summer, and monthly intervals in winter is preferable to frequent superficial irrigation.

Most citrus produce abundant fruit towards the lower edges of the “skirt” of the canopies, especially when frosts occur at bloom time (the lower blooms are more protected). Therefore, pruning to raise the foliage to create more space at ground level and/or a shady space underneath necessarily reduces the amount of fruit. To be sure, as always, except for removal of dead, crossing, or diseased branches, the “right” pruning depends on a gardener’s priorities.

Sweet limes are slightly frost tender for our winters, especially when young. Indeed, during the prolonged hard freeze in the winter of 2013, the young sweet lime trees in the orchard froze back to the ground. In the spring, we cut back the “burnt” branches and the trees all grew from the ground with multiple new shoots. This can be overcome if young trees are covered with frost cloth—and even warmed with heat lamps—during deep freezes. Sweet limes are very productive, and ripe fruit persists on the tree for months.

Sour oranges are vigorous fast-growing tall trees with dark leaves and strong root systems. They can adapt to different soils, withstand deep freezes (temperatures as low as 8 degrees F for short periods), wet and cold conditions, and all forms of neglect. They are disease resistant and can live up to 600 years. It is no wonder they are customarily used as rootstock by horticulturists who need a hardy variety on which to graft a more delicate type of citrus.

Valencia oranges have hard skin that enables good shelf life. They are large, disease-resistant trees that produce heavy crops. Valencia fruit need to be exposed to high heat to mature. Here in the Sonoran desert, since that requirement is met just a few weeks before bloom, there are only 11 months from bloom to maturity, whereas in colder climates it can take

several months longer for Valencia oranges to reach maturity.

Meyer lemons are somewhat frost sensitive. Mature trees are around 6 to 10 ft tall, and exceedingly productive.

Pummelo seeds are true to type. They are somewhat frost hardy, and relatively salt-tolerant, which is ideal in Tucson, since our soils tend to be salty.

Grapefruits are among the most successful citrus varieties in Tucson, producing tall robust trees and prolific crops.

Key limes are cold sensitive, but once they get established and grow to a mature size, they do well in the Tucson Basin.

Tangerines are slightly frost tender when the trees are small, but can thrive once they are well established.

Apricot. For three hundred years apricots were common orchard and backyard trees in Tucson. These frost-hardy deciduous stone-fruits can grow up to 33 feet tall, and produce an abundance of fruit, but they are susceptible to the increasing aridity and longer periods of high temperatures we have been experiencing in recent decades. Many of the local heirloom apricot trees have succumbed to disease, to the point where they have become quite rare in the area. Apricot trees generally require rich soil with good drainage and regular abundant irrigation. It is imperative to keep trunks clear of mulch and make sure irrigation water is applied at the drip line rather than around the trunk, to prevent fungal disease.

Grape. Mission Grapes thrive in the Sonoran Desert climate and soils, but they are hosts to the grape leaf skeletonizer (*Harrisina brillians*), a moth whose larvae feed on grape leaves. Practitioners of organic agriculture here in the low desert clip off and discard affected leaves, or spray periodically with BT (*Bacillus thuringiensis*). Grapevines are also susceptible to thrips, which don't do much harm, but can turn make leaves mottled and dry.

For fruit production grapevines must be pruned every year during the cold season when the plants are defoliated. As grapes begin to form in spring, additional pruning of tips helps concentrate energy into the grape clusters, which can be protected from birds with transparent cloth bags, starting in June.

In addition to food, grapevines can serve to cool south-facing facades and provide a shady outdoor gathering place in summer, without blocking welcome summer sun in winter when they are leafless. This is an ancient traditional method of sustainable climate control, still widely practiced throughout the Mediterranean and Middle East.

Olive. Olives are heat and drought-loving evergreens that prefer poor alkaline soils and withstand temperatures as low as 21 degrees, for short periods of time. Easily propagated from cuttings, they grow slowly and can live thousands of years. In Tucson, olive trees have typically been raised as shade trees. However, traditional Mediterranean-style pruning for production of olives involves leaving trees

"dressed down to the ground" to protect the trunks from sunburn, and for easier, more abundant harvest.

When the main stems are 6 inches in diameter a sort of pollarding is practiced from a base height of five feet. As soon as aging branches begin to get rough, they are cut at this height, so that the producing branches are always young and supple. It is best to prune before bloom, which occurs here in March.

Peach. Peaches are relatively short-lived deciduous trees that grow between 10 and 20 ft tall, depending on how they are pruned. Their pink flowers appear in early spring before the leaves. Peaches are stone fruits, with corrugated seed shells that are more likely to germinate if planted fresh (not dried). The seeds also need to be exposed to cold for proper germination, and the trees need to be exposed to a minimum number of chill hours for fruit set. The Cucurpe heirloom variety is very well adapted to our climate and soil conditions. If planted from seed, it can begin producing fruit within four years.

Loquat. Loquats are relatively easy to grow from fresh seed, although they will not be exactly true to type, and they will be six to nine years old before they begin to bear fruit. Some cultivars are better adapted to the scorching summer heat of our region than others. The Tucson cultivar was collected from an old tree in downtown Tucson that is probably the tallest loquat tree in town, reaching 55 feet. Of course, loquats can be kept much shorter and bushier for ease of harvest. Not surprisingly, the Tucson cultivar seems to be much more heat resistant than the one collected in California. Desert-adapted varieties can grow in full sun, whereas many of the varieties adapted to milder climates will grow better in partial shade, and protected from the afternoon sun to prevent scalding on leaves, trunks, and even fruit. In any case, even the desert-adapted cultivars—adapted to our temperature extremes—will need rich soil, and regular deep watering.

Jujube. These thorny deciduous trees can grow up to 30 or 40 feet. They thrive in Tucson growing conditions, as they are highly drought, heat and cold tolerant, as well as disease resistant. Moreover, they grow well in marginally fertile, sandy soils with high salinity and alkalinity. Plants send out suckers from their roots so they can become invasive if left to their devices. Fortunately, these suckers can be easily kept in check by cutting or mowing, or they can be dug up and replanted elsewhere.