



Linking Edible Arizona Forests

Growing Edible Arizona Forests, An Illustrated Guide

Excerpt from *leafnetworkaz.org*

Edible Tree Guide

CHOOSE Planting Site and Design

- Tree Spacing

Tree Spacing

Consider tree spacing long before you plant. In addition to the site considerations discussed in earlier sections, pay special attention to utilities; distance from buildings, walls and curbs; access to trees; pollination distance; mature tree sizes; and the potential for multistory plantings, as discussed below.

Utilities

Do not place trees where planting, care and harvesting could be a safety hazard—such as under overhead utility lines or over buried utility lines. See leafnetworkaz.org CHOOSE – Site Conditions for more information. Hazards could include hand shovels and machinery piercing underground electric, gas, water, sewer or communications lines. Tree roots could grow into pipes and clog them. Tree branches could grow into overhead electric lines and present a fire and electrocution hazard.

Buildings, streets, slabs and curbs

Place trees far enough away from buildings, walls, streets, concrete slabs and curbs so roots do not grow into foundations or crack curbs, roads or slabs. Do not plant trees where they could block traffic signs or vehicle visibility. To minimize wildfire danger and damage to roofs, tree canopies should not overhang roofs or be planted right next to buildings; see leafnetworkaz.org **CHOOSE – Wildfire** for more information. Avoid putting trees against shared walls, since part of the tree will overhang the neighbor's yard, roots could impact wall foundations and trees will be difficult to maintain.

Access

In site design, lay out pathways to and around trees. You may need to plan for access into the site for vehicles or machinery used for maintenance or new construction. Trees can be placed in clusters, with wider access ways between them for wheelbarrows, mowers, vehicles or other machinery.

Pollination

Many trees need cross-pollination to produce fruit, nuts, berries, seeds or pods. Fruit trees that require cross-pollination by honeybees should be within 100 feet of one another, but can be planted much closer. Plant wind-pollinated tree species within 50 feet of one another to ensure good pollination.

During the design phase of your food forest, public site or backyard area, plan ahead:

- Do not plant over buried utilities or under overhead utilities lines
- Design sites for easy access to edible trees
- Space trees to facilitate pollination
- Provide enough space for trees to reach their mature size
- Consider multistory plantings to increase site benefits and ecological diversity



In a public park, well-spaced native edible trees are accessed by a raised sidewalk that provides rainwater runoff to the adjacent trees.

Trees Sizes

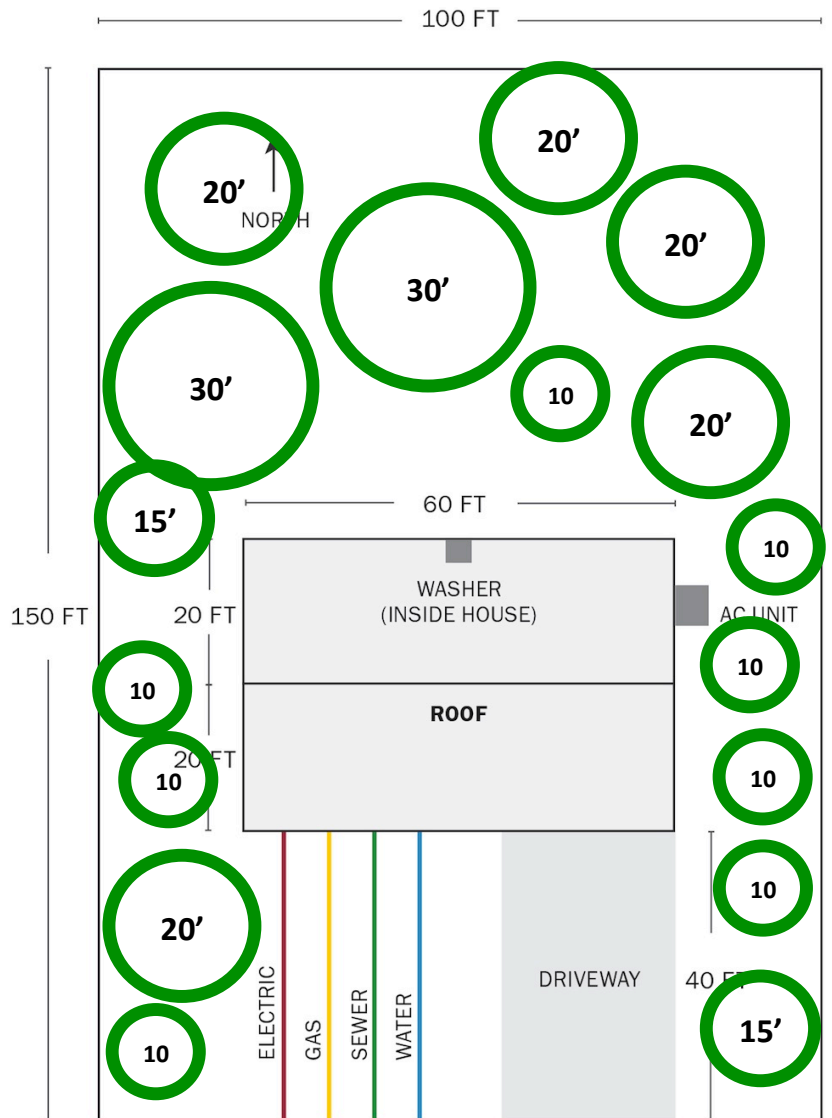
To provide sufficient space for trees to grow, imagine fully grown trees when planning tree spacing. To ensure that mature branches will have adequate sunlight, water, and nutrients, plant full-sized trees at least 30 feet apart. In some cases, full-sized trees can be pruned or trained to fit smaller spaces.

Semi-dwarf and dwarf trees require less space and less water when they are full grown than standard trees. These trees can be planted closer together than standard-sized trees, increasing the number of trees in a given space while leaving room for tree care and harvesting. Some dwarf trees may also be grown in containers. Choose trees whose stature and size matches the space you have, and place them thoughtfully within the available space.

To help determine the species, number and spacing of trees for your site, you can prepare a site map and draw circles to represent mature tree canopy diameters. The table **Canopy Diameter and Height of Selected Edible Trees** at the end of this section provides size ranges for common edible trees. The **Edible Tree Directory** at leafnetworkaz.org provides sizes of additional trees and shrubs. For more information on trees sizes in general see leafnetworkaz.org **LEARN - Tree Sizes**.

Multistory planting

To make the most of limited space, water and nutrients, most *overstory* edible trees can be interplanted with *midstory* edible shrubs and *understory* herbs, cacti, succulents and vines, to create a diverse *multistory* structure. Growing a *multistory*, multiseason and multiuse edible landscape can benefit people, attract beneficial pollinators and pest-predators, and provide habitat for birds, insects and other wildlife.



In this site example, trees are placed based only on mature tree canopy size within the available land. Other criteria not shown here that should be considered include available rainwater and other water supplies, tree-spacing in wildfire-prone areas, Arizona elevation areas and other factors specific to a site.

Tall trees provide shade, higher humidity and frost protection for smaller plants beneath them. Native mesquite, palo verde and ironwood trees add beneficial nitrogen to the soil, increasing organic matter and soil nutrients. Planting a diverse mix of species mimics the natural environment and will create a healthy forest over the long term.

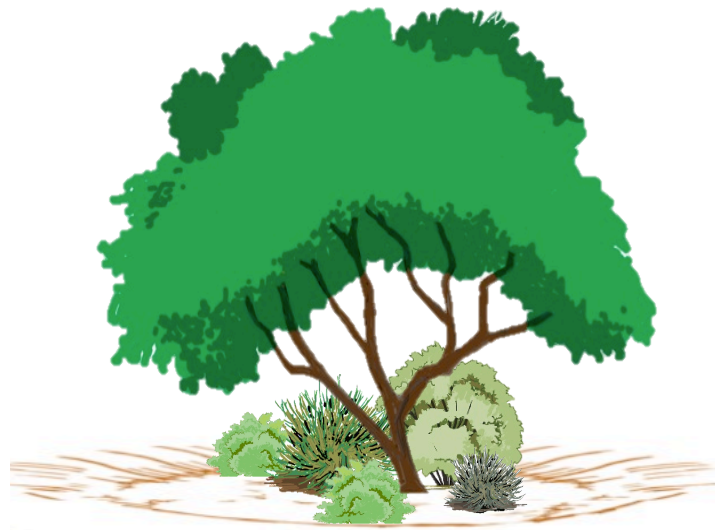
In multistory plantings, determine appropriate tree spacing first, then place shrubs, herbs, cacti, succulents and vines in between the trees to create an open, structurally diverse environment that people can comfortably access for care and harvesting. Information about edible understory plants suitable for different elevation areas in Arizona are described in the **Edible Understory Plant Directory**, located at the leafnetworkaz.org **Edible Tree Directory**.

Each plant needs water, sunlight, and nutrients. If plants are too close together they will compete for these resources and fail to thrive. If they are too far apart they might not have the benefits created by the microclimates of the taller species, such as shade, frost protection and soil improvements. Note that some edible trees such as juniper and pine can have components in their roots or fallen needles that do not combine well with understory species.

Selecting more than one kind of fruit—or different varieties of the same fruit—to plant within a multistory landscape can extend the ripening season for several months. See the Harvest Table and the Edible Tree Directory at leafnetworkaz.org to select edible trees for your Arizona region that ripen in different months. For example, Anna or Carolina red June apples will mature in early summer, while later winter apples such as Arkansas black ripen in October and can be harvested until December. As you select your tree types and varieties, talk with neighbors, local nurseries, Cooperative Extension agents and other professionals to learn about the varieties that will thrive in your area and their tree-spacing needs.



Chiltepin, wolfberry and desert hackberry shrubs are understory plants that produce edible fruits that benefit both people and wildlife.



Edible understory plants can be placed under an edible tree within the same water harvesting basin. If adding understory plants under an existing tree, make sure the tree is well watered before disturbing the soil and minimize disturbance to existing roots. Planting by seed is less disruptive to the tree.

AVERAGE CANOPY DIAMETER AND HEIGHT FOR SELECTED STANDARD-SIZED TREES, IN FEET

| Edible Tree | Canopy Diameter | Tree Height | Edible Tree | Canopy Diameter | Tree Height |
|--------------------------------------|------------------------|--------------------|--------------------|------------------------|--------------------|
| Almond | 10-15 | 20-30 | Hackberry, netleaf | 35 | 35 |
| Apple | 15-20 | 15-30 | Hawthorn | 10-30 | 15-50 |
| Apricot | 20 | 25-35 | Ironwood | 15-25 | 15-45 |
| Bay laurel | 10-30 | 10-60 | Jujube | 10-15 | 20-40 |
| Carob | 25 | 25 | Juniper | 20-40 | <50 |
| Cherry, sweet | 15-30 | 30-60 | Loquat | 15-20 | 20-30 |
| Cherry, sour | 15-30 | 15 | Medlar | 10-20 | 10-20 |
| Cherry, capulin | 20-30 | 30+ | Mesquite | 30 | 30 |
| Cherry, wild black | 35-50 | 60-100 | Mulberry | 20-30 | 30 |
| Citrus: calamondin | 20 | 20-30 | Mulberry, wild | 20-30 | 20 |
| Citrus: citron | 20 | 20-30 | Oak | 40+ | 60+ |
| Citrus: grapefruit | 15 | 20 | Olive | 30 | 30 |
| Citrus: kumquat | 5-10 | 10-15 | Palo verde | 25-30 | 20-30 |
| Citrus: lemon | 20 | 20-30 | Peach & nectarine | 15-25 | 15-25 |
| Citrus: lime, makrut, kaffir | 5-10 | 5-10 | Pear, Asian pear | 15-25 | 30-60 |
| Citrus: lime, Mexican | 15 | 15-20 | Pecan | 35-75 | 60-120 |
| Citrus: lime, sweet | 15 | 15-20 | Persimmon | 15-25 | 40-50 |
| Citrus: limequat | 10 | 10 | Pinyon pine | 20-40 | 30-60 |
| Citrus: mandarin, tangerine, satsuma | 20 | 20-30 | Pistachio | 15 | 20 |
| Citrus: orange, sour | 20 | 20-30 | Plum | 15-25 | 15-25 |
| Citrus: orange, sweet | 20 | 20-30 | Plum, wild | 15-20 | 15-20 |
| Citrus: pummelo | 20 | 20-30 | Pomegranate | 10 | 15 |
| Desert fan palm | 15 | 30-60 | Quince | 25 | 15-20 |
| Date palm | 25-30 | 40-90 | Saguaro | 15 | 45+ |
| Elderberry | 10 | 10-30 | Sapote, white | 20-30 | 20-60 |
| Fig | 15-50 | 10-30 | Walnut, English | 30-45 | 30-60 |
| Guava | 10-30 | 10-30 | Walnut: wild | 30 | 30-50 |