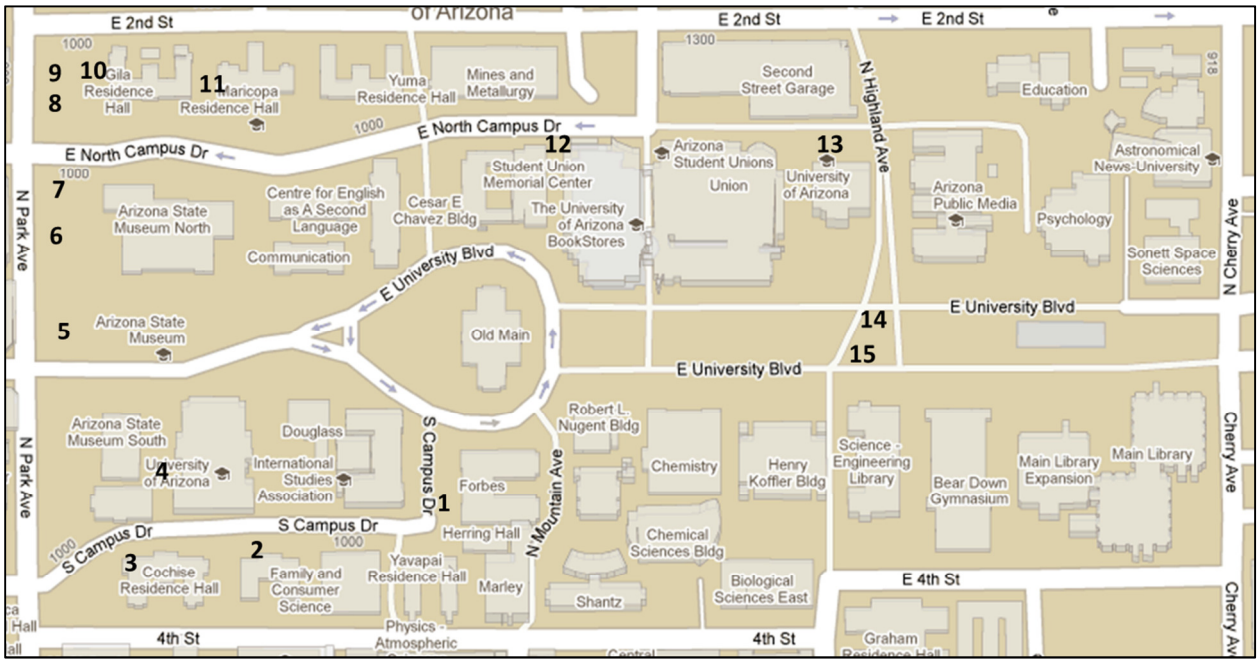
THE UNIVERSITY OF ARIZONA | COLLEGE OF AGRICULTURE & LIFE SCIENCES
CAMPUS ARBORETUM

Edible Landscapes



Landscape Trees Producing Edibles Promote Urban Sustainability.

As Arizona's Land Grant institution, The University of Arizona was charged with the responsibility to offer applied research and education focused on addressing solutions to challenges of relevance in Arizona. This practical focus led to major developments in Mining and Agriculture in the early years, and continued excellence in urban horticulture in later years through research, education and outreach. From the very beginning, trees and shrubs were planted, and studied creating an "oasis" of learning in desert horticulture. Throughout its history, UA faculty used the campus grounds as a test site for potential new agricultural commodities, introducing olives, citrus, and date trees, to name a few. Later, in response to population growth, urban development and concerns for resource conservation, faculty interests expanded to include arid-adapted landscape ornamentals that were also tested. As a result of this long-standing commitment, almost ¼ of the trees on the main campus produce edible products.

To promote sustainability, the Campus Arboretum directs conservation of resources through reduction of water, labor, and chemical inputs in landscape management. Further, we aim to maximize the benefits of campus trees by providing guidance on tree selection, preservation, and management to enhance longevity, tree structure, aesthetics and safety. As we reduce inputs and increase outputs (benefits trees provide), we're creating a self-sustaining system that provides more for human and environmental health than what it consumes. Similarly, through recent efforts to support harvest of campus edibles, we're capturing greater returns on our investment in the campus grounds. As you walk through campus today, we hope you'll appreciate the beauty as well as utility of this living example of urban sustainability research.

Edible Landscapes Tour

1. ***Prosopis alba*** **– Argentine mesquite (Forbes)**
   Fabaceae

This is the first of several mesquite species we'll be looking at on this tour. The Argentine mesquite, *Prosopis alba*, hails from South America and has been used in the Southwest primarily for its handsome form and appearance. However, the mess of beans each tree produces every year contain a nutritious pulp. This pulp can be extracted via milling and processed into a sweet-tasting flour that possesses a characteristic smoky, malty flavor. However, one can't simply walk up to any tree and harvest pods. Each tree, unless grown from a cutting, is genetically unique and may produce flour high in bitter tannins. As it happens to be, these ones produce beans that are bitter and chalky. We'll talk more about mesquites when we get to other species.

2. ***Ficus carica*** **– common fig, fig (Saguaro Hall)**
   Moraceae

The fig has been a food of prominence for thousands of years. *Ficus carica* produces a bounty of sweet fruits. These fruits are delicious both fresh and dried. The fig has played an important role in many historical and cultural occurrences, such as clothing Adam and Eve, feeding Dionysus, and incurring the wrath of Christ. Many species of fig exist and most are edible.

3. ***Phoenix dactylifera*** **– true date palm (Cochise Hall)**
   Arecaceae

The true date palm, Phoenix dactylifera, is grown for its highly prized fruits: dates. Generally grown in arid regions with supplemental water, a single tree can produce in excess of 250 pounds of dates per season. The word "date" comes from an Ancient Greek word "dáktulos", meaning finger. The top producing countries of dates are Egypt, Iran, and Saudi Arabia, with total world production center around the Middle East.

4. ***Punica granatum*** **– pomegranate (Women's Plaza)**
Lythraceae

This beautiful scarlet fruit has been a prized, delicious and refreshing delicacy for centuries. *Punica granatum* has been mentioned as early as Homer's poems, and is found 25 times in the Bible and 3 times in Quran. The pomegranate is native to Iran and it is now widely cultivated throughout India and the drier parts of Southeast Asia, Malaysia, the East Indies, and tropical Africa. Recent research has shown it to be a powerful superfood, high in antioxidants, and a possible dietary treatment for a range of ailments.

5. ***Olea europaea*** **– European olive (Olive Walk)**
Oleaceae

Olea europaea, a member of the eponymous Oleaceae family, is another plant species on campus that has been cultivated for thousands of years. These trees were planted on the UA campus about a century ago as a part of Arizona's Extension Research. Originally, these trees served as part of variety trials to determine the best cultivars for olive production in the Southwest. These olives represent a select population of flowering olives left in the state of Arizona as planting flowering olive trees is now prohibited in many Arizona cities.

6. ***Morus alba*** **– mulberry (Green Belt)**
Moraceae

The mulberry, *Morus alba*, is an important feedstock for the silk industry. It produces small, red, or white fruits that resemble raspberries in shape but lack a distinctive flavor. The fruits may be eaten raw or processed into preserves, syrup, or wine. Interestingly, the pollen of the mulberry is ejected from the flower at approximately half the speed of sound.

7. *Ziziphus jujuba* – Chinese jujube (Green Belt)
Rhamnaceae

Ziziphus jujuba produces abundant, walnut-sized fruits that resemble apples in flavor and texture. This tree is believed to have been domesticated for nearly 11,000 years in South Asia. However, its extensive cultivation has made it difficult to determine its actual origin. The fruit can be smoked, candied, dried, or made into a wine or liquor.

8. *Pinus pinea* – Italian stone pine (Green Belt)
Pinaceae

Identified by its characteristic umbrella shape when mature, *Pinus pinea* has been cultivated for 6,000 years in the Mediterranean. Small seeds from this tree are shelled and eaten raw or cooked. High in protein and fiber, the nuts have a delicate pine flavor with a buttery texture. Often roasted to bring out the subtle flavors, the nut is essential for making pesto. Seeds from other pines can be shelled and eaten as well, but most pine seeds are too small to be worth the labor of processing.

9. *Ceratonia siliqua* – carob (Green Belt)
Fabaceae

This common chocolate substitute, *Ceratonia siliqua* is another Mediterranean native grown in the American southwest. Related to the pea plant, this tree produces pods containing a dry seed that can be used as a sweetener. Egyptian hieroglyphics used the bean's shape to represent "sweet". The term "karat" is from "karob", as the seeds were used as a standard weight in ancient times because they are so consistently weighted. John the Baptist's diet consisting of "locusts and wild honey" very well may have been carob and honey, because the original Greek could also translate to carob. Carob is used in modern times as a healthier substitute for chocolate, containing significantly more antioxidants and less fat than the cacao-derived chocolate.

10. *Celtis reticulata* – hackberry (Gila Hall)
Cannabaceae

This Arizona native species has inhabited the state since before the last ice age. Its attractive habit and intricate foliar patterns make it an attractive addition to a native landscape design. Hackberry fruits are small berries with a single hard seed and a thin sweet flesh that can be ground to make jellies, syrups, or wine. The berries can also be eaten fresh, but doing so is extremely tedious because of their small size and thin flesh.

11. *Citrus* sp. – citrus (Gila/Maricopa Hall allee)
Rutaceae

An important group of crops in Arizona, the Citrus, has an annual lemon production in Arizona approaching one million metric tons. On campus, we have a wide range of representatives from the the citrus family, including sweet orange, sour orange, lemon, Meyer lemon, tangelo, grapefruit, and calamondin. The genus originated in Southeast Asia, finding its way across the globe over several millennia. About 30% of citrus production in the U.S. is actually for processed products such as juice, juice concentrate, and food products. The rest is eaten fresh domestically or internationally. In the U.S., 5-10 main species are widely consumed, but there are dozens more species with interesting characteristics.

12. *Prosopis glandulosa* var. *glandulosa* – Texas honey mesquite (Student Union Allee)
Fabaceae

By far the most tantalizing of the mesquites on campus, Texas honey mesquite lives up to its name that promises something sweet and tasty. The pods of this Southwest native are high in sugar and protein, making an excellent flour from the pulp (like other mesquites). The fruits were an important food source for native peoples, especially since it produces a crop even in drought. Wild animals also rely on its nutritious pods for sustenance during dry years. Here in Tucson, you can pick pods and attend the Desert Harvester's annual mesquite grinding event to produce flour.

13. Agave sp. – agave (Administration Building)
Asparagaceae (previously Agavaceae)

While this specimen isn't the blue agave used in tequila production, it is closely related. Blue agave is used to produce tequila in the state of Oaxaca, Mexico and related drinks elsewhere. To do so, the plant must be grown for twelve years to maturity. Once mature, the leaves are stripped, and the heart is harvested for further processing. After being baked, the hearts are pressed and the resulting juice is used to produce tequila. In the wild, once agaves grow to maturity they produce a large flower stalk and then die.

14. *Carnegiea gigantea* – saguaro (Krutch Garden or Student Union on South Side)
Cactaceae

This is the majestic saguaro cactus. One might not think of the saguaro as an "edible plant", but it has provided nutritious fruit to the natives of Sonora for centuries, particularly the Tohono O'odham nation. Requiring 75 years to develop one side arm, the cactus can live for up to 200 years. Its white flowers open in the night, attracting the bats needed to transport pollen from flower to flower. Each pollinated flower develops into a fruit that contains up to 2,000 seeds. The bright red, fleshy fruit is eaten fresh, juiced, or made into preserves, wine, or syrup.

15. *Opuntia* sp. – prickly pear (Krutch Garden or Student Union on South Side)
Cactaceae

Here we see a representative of the Opuntia cacti. A member of the Cactaceae family, each plant produces numerous sweet fruits every year. These fruits are prized by natives for their sweet, refreshing flavor. However, they don't come without a price. The fruits are covered in small spines and irritating hairs, called glochids. Despite their defenses, one can remove the hairs through singeing them in flame, or shaking the fruits in sand. The flesh is sweet, juicy, and the flavored is said to resemble watermelon. The fruit can be eaten whole, juiced, or made into preserves, wine, or syrup.

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