Scientific Name: *Olneya tesota*

Common Name: ironwood

Botanical Family: Fabaceae

Botanical Characteristics:

Olneya tesota is a perennial, evergreen shrub or tree with a short trunk and spreading rounded and broad, dense canopy (1, 3, 4). It grows to 10 m (30 ft) tall with a trunk of 0.3-.6 m (1-2 feet) in diameter (4). Its bark is medium to light grey, armed with small, somewhat curved, twin spines and exfoliating with age. Both twigs and leaves are covered with small grey-white hairs, that serve to protect the tree from the worst of the hot sun (1, 2). The foliage is evergreen except during cold winters (4). Leaves are even-pinnately compound, alternate with 8-21 obovate or ellitic, dull green, somewhat thick leaflets (3, 4). Papillionaceous flowers appear in late Spring (foresummer), are pea-shaped/winged, 10-14 mm across with fused filaments and a pale pink to purple corolla with yellow-white to pale pink keel

(3). Flowers are borne on axillary 2-many flowered racemes (3). Fruit is a 4 cm (2 inch) oblong or ellipitic, plump legume pod, with constrictions between seeds (4). The pod slowly dries to a dark brown color, eventually splitting in summer before monsoon rains – to release 1-3 seeds (4).

Compound: Oln tes
Geographic Origin: Desert Southwest
Ecozone Origin: Nearctic
Biome Origin:

Natural History:

Ironwood is distributed southwestern North America – from southeastern California, and southern Arizona into northwestern Mexico (Baja Norte, Baja Sur, and Sonora) (3, 6). It is most commonly found at elevations below 900 meters (usually more like 2,500 feet) elevation in foothill (dry-desert) washes of the low desert areas where storm runoff increases the available moisture (3, 4) Ironwood is the only species in the Olneya genus (2). The genus is named for Stephen Thayer Olney (1812-78), a businessman and botanist of Rhode Island (4). The specific epithet “tesota” is derived either from a Spanish word for stiff, “tieso” or from a Southwestern indigenous word for the tree (4).

Cultivation Notes:

The ironwood is readily propagated from seed. If harvesting dry, brown pods, remove the seed into a clean sheet of paper or fabric. Press (or step on) the pods gently to crush the dry pods. Winnow out the seeds and place them in a sealed container in the freezer for two days to prevent bruchid-beetle infestation. Store in the freezer until use or take them out, dry thoroughly and then store in a sealed jar (1). Fresh seeds require no treatment, whereas stored seeds should be treated before attempting germination (4). The hard seedcoat of stored seeds benefits from scarification before sowing in order to speed up and improve uniformity of germination (6). This is done by pouring very hot water on the seeds and allowing them to soak in the water as it cools – remaining for 12 - 24 hours in tepid water (6). Seeds that have successfully imbibed moisture will be swollen and can be germinated in shallow potting mix or directly into the ground. The ideal germination temperature is 25 – 30°C. Fresh seeds have a high rate of germination success (80 - 90% germination) and emerge in 4 - 12 days. (6) Care should be taken to protect from “damping off disease” from excessively cool and damp conditions during germination (1).

Ironwood seedlings have a strong taproot that poses risk to a successful transplant (6). As such, some recommend that seeds are sown directly in the ground (being sure to protect from pests) (6). If sown in containers, use tall pots or deep containers and transplant into their permanent location when the seedlings are large enough or before the taproot reaches the bottom of the container (6. It has a moderate growth rate and requires very little water. The ironwood tree does well in full sun and is hardy to 15°F. It is a drought deciduous tree, during dry periods it will shed its leaves to preserve water and conserve its energy for flowering and regeneration after the spring rains. Ironwood is considered low water use, requires full sun, dry soil, and is tolerant to dry, rocky and sandy soils (4).

Ethnobotany:

Ironwood flowers and seeds are edible. Desert Ironwood flowers can be eaten raw in salads or candied for use in desserts. Although the seeds can be eaten raw, both green and dry/brown stages of seeds may be most easily digested when blanched, sprouted or cooked (1, 2). The flowers bloom in late April-May and seed pods set in June-July. When they are ripe, they are easier to gently shake free from the limbs. If harvesting green pods, plunge the pods into boiling water and then transfer to ice water to clean them. Drain, dry and package them in sealed plastic (anaerobic) containers marked with the date of harvest (1). Seeds are usually eaten cooked or dried, lightly roasted and then ground into a flour before use, though they are also eaten whole after roasting (4, 6). The seeds have been used to make a beverage similar to hot chocolate (6). The pods have a slightly sweet and nutty flavor with some astringency but become more flavorful when left to ripen on the tree (1, 2). Some describe the taste and texture of the seed as similar to the taste of peanuts (5, 6). They are very high in protein (~ 19% protein) as well as carbohydrate (~61%) and fat (~10%) (6). The dried, powdered seed has a higher digestibility rating (74% for uncooked and 79% for cooked seeds) compared to other legume beans (6). As such, ironwood seeds may have potential to be commercially produced for human food (6). The seeds do, however, contain small amounts of trypsin inhibitors, phenols, alkaloids and haemagglutinin, known collectively as “antinutrients” but these are soluble and removed with soaking or cooking (6).

Ironwood is the tallest growing tree in the Sonoran Desert and provides a beneficial micro-habitat for many desert species. As such, these are considered “nurse” trees in the Sonoran Desert (4). Animals gather in the shade during the hottest months and other cacti and small shrubs utilize the tree's canopy as shelter from the sun. Like other members of the family Ironwood, it is a tree that gathers nitrogen from the soil, so leaf litter and seeds are particularly rich in nutrients. Desert animals also consume the seeds, and livestock browse the foliage. Seeds eaten by desert animals; plant browsed by bighorns.

Ironwood, in natural populations, has a very deep taproot allowing it to access water in the cooler soil depths (6). This factor, along with its ability to fix nitrogen makes it an excellent companion tree in a mixed planting (6). Additionally, it generally produces very few branched roots near the soil surface, bringing water and nutrients from deep down with its taproot to enrich the neighboring plants which have a more shallow root system (6). It further adds nutrients to the surface when it drops its leaves (6). Because of its preference for areas with mild winters, it is considered an indicator in selecting favorable sites for citrus orchards, mild winters (4, 6).

Olneya tesota is known locally in the Sonoran desert as "Ironwood" or by the Spanish common name palo de hierro. These names point to the use of ironwood trees are the source of very dense, hard wood. The heartwood is a rich brown and somewhat variegated and the sapwood provides a thin layer of yellowish white, having an irregular grain with a good luster when polished (4, 6). The wood is very hard and strong (reportedly as hard as ebony) and is dense/heavy enough to sink in water (6). Only leadwood (*Krugiodendron ferrum* (Vahl) Urban), a small tropical tree of southern Florida, is heavier (4). The hardness makes it difficult to work with using hand tools and even machine tools have trouble keeping a sharp blade, it is used for making small objects such as gift items, pens and

carvings and for fuel and charcoal (4, 6). Native cultures in both Arizona and Sonora made use of the wood for building as well as for making small carved items (2).

Height: 20 - 50 feet
Width: 20 - 50 feet
Growth Rate: Slow Growing
Grow Season: Summer
Flower Season: Spring
Color: Lavender
Function: Shade
Spread:
Allergen: Non-allergenic
Invasive: No
Toxicity: Benign
Hardy: Semi-hardy
Water Use: Low water Use

Resources:

1. Desert Harvesters Retrieved June 12, 2024
2. Mielke, Judy. Native Plants for Southwestern Landscapes. University of Texas Press, 1993.
3. Jepson Herbarium Retrieved June 12, 2024
4. Ladybird Johnson Wildflower Center Retrieved June 12, 2024
5. Plants for Our Future Retrieved June 12, 2024
6. Useful Temperate Plants Retrieved June 12, 2024