Olneya tesota

A. Gray

Fabaceae - Papilionoideae

LOCAL NAMES
English (tesota,desert ironwood)

BOTANIC DESCRIPTION
Olneya tesota is a conspicuous small tree up to 10 m in height, commonly with several trunks. The trunks can attain a diameter up to 60 cm on very old individuals. Young twigs up to 10 or 15 mm thick, green. Bark grey and smooth, fissured and shredding on older trunks. Sharp, paired spines, 3-11 mm long at nodes.

Leaves simple, pinnately compound up to 6-cm long; leaflets 6-20 greyish-green in colour, 7-20 mm long. Ten or fewer pairs of leaflets to 1 cm long; spines at base of leaves, paired, slightly curved, 0.6 cm long, and usually brown-tipped. Foliage evergreen to semi-deciduous.

Flowers pink to lavender, papilionaceous; 15 mm long, appearing in short, dense racemes or panicles in late spring.

Mature pods dehiscent, several seeded.

Seeds 5-6 mm in diameter.

The genus Olneya is monospecific and can be easily mistaken for Palo Verde (Cercidium spp.) but has a greyer color and lacks the distinctive yellow flowers in spring.

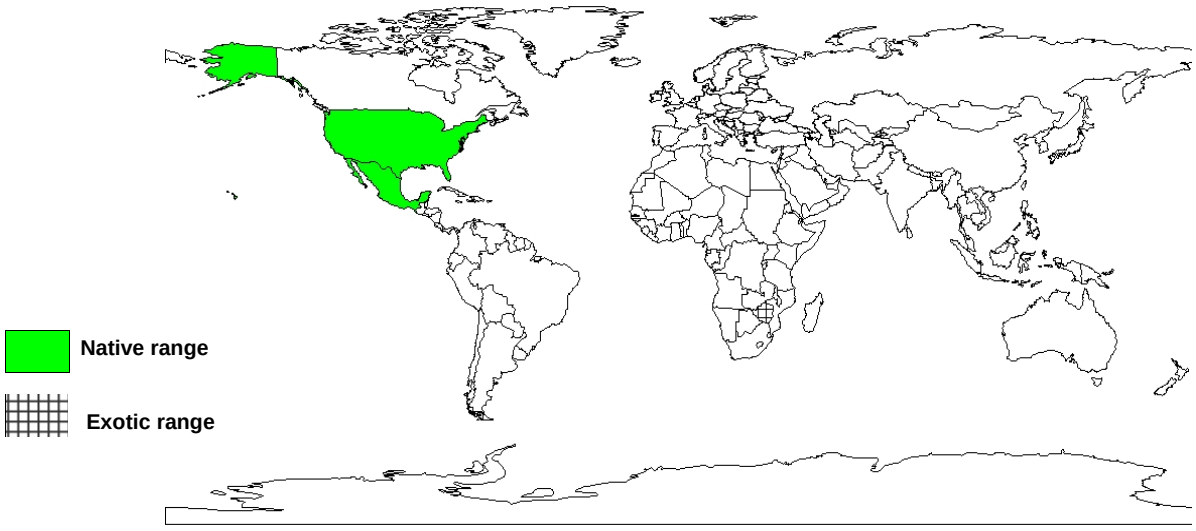
BIOLOGY
Flowering is prolific every two in five years, usually late in spring, pods ripen in summer.

ECOLOGY
O. tesota is a dominant component of many plant communities. It is usually restricted to dry desert watercourses, sandy and rocky soils of plains, slopes and along dry washes, where storm runoff increases the available moisture. The largest individuals are found in these habitats, often forming woodlands with other desert trees including Cercidium floridum, Prosopis glandulosa var. torreyana, P. velutina, Acacia greggii, and others. O. tesota is endemic to the Sonoran Desert Region, Mexico. It is found in central and southwest Arizona and southeast California, USA, much of the Baia California peninsula, western Sonoran and extreme northwest Sinaloa, Mexico. O. tesota is adapted to hot climates, tolerates some freezing but generally sustains stem damage below -60 deg C. Prolonged exposure to lower temperatures may cause severe damage or death. It tolerates summer temperatures of 45 deg C. Because of its preference for warmer sites, O. tesota has been used as an indicator plant in choosing locations for citrus plantations.

BIOPHYSICAL LIMITS
Altitude: 0-900 m
Mean annual rainfall: 75- 400 mm.
Soil type: Prefers well-drained soils with infrequent, deep irrigation, pH range of 7-8.5.

DOCUMENTED SPECIES DISTRIBUTION

Native: Mexico, US
Exotic: Zimbabwe



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Food: Fresh, uncooked seeds have a taste similar to soybeans. The native Seri Indians of Sonora, Mexico, cooked the seeds in water, emptied the water and then cooked the seeds a second time in fresh water to remove an unpleasant smell. The cooked seeds are eaten whole, or ground and salted. Roasted seeds have been used as a substitute for coffee.

Fodder: Wildlife and domestic livestock browse the foliage to some extent.

Fuel: O. tesota is cut for fuelwood and charcoal production, widespread cutting of O. tesota has seriously reduced the numbers of these trees in areas of Mexico.

Timber: The wood is very hard, one of the heaviest in the world, dense and durable. It will not float in water. The wood is used for gift items, pens and carvings. The heartwood is dark brown and takes a beautiful polish.

Poison: The seeds contain canavalin, a mild toxin.

SERVICES
Erosion control: The tree is useful for soil conservation.

Shade or shelter: Tesota makes an excellent shade tree with its multi-trunked stem and low-branches.

Nitrogen fixing: O. tesota seedlings grown in nitrogen free media produced nodules when inoculated with soil taken from beneath wild trees. Nodulation has been reported from cultivated trees in Zimbabwe.

Ornamental: O. tesota is cultivated as a landscape tree in hot arid regions of southwestern United States. The nearly evergreen foliage, dense shade, showy flowers and attractive form make it well suited for a variety of landscape functions.

Boundary or barrier or support: The desert ironwood is also used as a screen plant.

Intercropping: Other desert plants, including shrubs, vines, cacti, and annuals, often grow in the microclimate beneath the canopy of O. tesota.

TREE MANAGEMENT
Young plants may be severely damaged by browsing, particularly by rodents. No significant disease problems have been reported. The plants do not appear to be fire resistant. The spiny stems can be a nuisance to people working around the plants, young trees should not be planted near pathways. The trees are long-lived attaining up to 200 years of age. The trees do not respond well to coppicing. Larger trees are usually killed by this practice and recovery of younger plants is slow. O. tesota grows slowly, prolonging the time it takes for the tree to reach flowering size. Typically slow growing in the wild, established plants can grow up to 60 cm per year under favourable conditions in cultivation. O. tesota shows no tendency to become weedy. The foliage is cold and drought deciduous but trees in favorable locations may remain nearly evergreen.

GERMPLASM MANAGEMENT
Scarification of the seeds enhances uniform germination but fresh seeds will germinate without scarification. Optimum temperature for germination appears to be 25-30 deg C. Fresh seeds often have 80-90% germination. Emergence usually occurs in 4-12 days.

PESTS AND DISEASES
Desert Mistletoe (Phorodendron californicum) can be a serious problem on O. tesota in its natural range. Heavy infestations can weaken even mature trees. Control can be achieved by periodically removing the clumps of mistletoe. Rodents eat tesota seeds.

FURTHER READNG

NFTA. 1992. Olneya tesota: a potential food crop for hot arid zones. NFTA 93-02. Waimanalo.

Young JA, Young CG. 1992. Seeds of woody plants in North America. Dioscorides Press, Oregon, USA.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)