

BOTANIC DESCRIPTION

Erythrina sandwicensis is a small deciduous tree 5-15 m tall with a short, stout, crooked or gnarled trunk, 30-90 cm in diameter. Branches spreading, stiff, crown broad, thin, wider than it is high. Bark smooth, light to reddish brown, becoming slightly fissured and thin with age; with scattered stout grey or black spines up to 1 cm long. Twigs stout, green with yellow hairs when young and scattered blackish spines.

Leaves alternate, compound, 13-30 cm long, with a long slender leafstalk. Leaflets three, short-stalked; terminal leaflet larger than the other two. Leaflets are 4-10 cm long and 6-15 cm wide.

Flower racemes hairy, yellow, stalk up to 7.4 cm. Flowers crowded in a mass, 7.5-15 cm long and short stalked. Flower color may be orange, yellow, salmon, green and white.

Pods approximately 10 cm long and 13 cm broad, flattened, pointed at both ends; containing 1-4 seeds, blackish and slightly narrowed between seeds.

Seeds elliptical, shiny red orange 13-15 mm long.

Erythrina comes from the Greek word 'eruthros'-red, alluding to the showy red flowers of the *Erythrina* species.

BIOLOGY

E. sandwicensis loses its leaves in the late summer or early fall (August to October), and leaves appear again during early spring to mid-summer (March to July), usually after flowering has occurred. Observations on Maui indicate that leaves drop during the dry periods of late spring or early summer (May to June). The tree flowers during the fall (September to November), flowers hermaphroditic. Leaves reappear after the first southerly storms in the late fall (November). Differences in observations may be tied to variation of annual soil moisture, and the considerable heterogeneity of flowering, leaf loss, and seed set within a single stand. Mature pods are found on the trees during winter months (December to February).



Warty bark at Puu o Kali Maui, Hawaii (Forest & Kim Starr)



Flowers at Puu o Kali Maui, Hawaii (Forest & Kim Starr)



Trunk at Puu o Kali Maui, Hawaii (Forest & Kim Starr)

ECOLOGY

E. sandwicensis is endemic to the leeward side of the Hawaiian Islands in lowland environments. It was once a dominant component of ancient endemic Hawaiian dryland forests. It is found where rainfall is usually concentrated between November and March, and survives extended drought and high winds. It thrives in the hot, dry foothills and lowland dry forest.

BIOPHYSICAL LIMITS

Altitude: 0-610 m

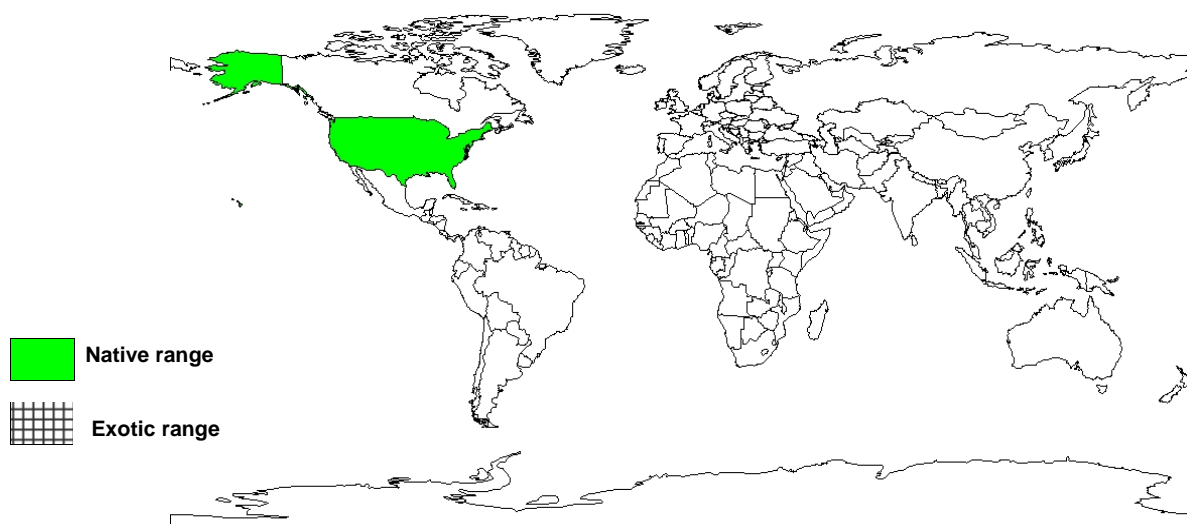
Mean annual rainfall: 500-1 250 mm

Soil type: *E. sandwicensis* prefers well-drained soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: US

Exotic:



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

Timber: Wood is lightweight and was used by ancient Hawaiians for fishing net buoys, surfboards and outriggers on canoes. More recently, wood from the wiliwili has been carved into imitation whale-tooth necklaces.

Tannin or dyestuff: It was also burned to make charcoal for use as color pigment to blend with other ingredients in making paint.

Other products: The bright red seeds were used for making leis.

SERVICES

Reclamation: *E. sandwicensis* is used in revegetation programs of highly eroded areas in Hawaii.

Nitrogen fixing: The tree forms a nitrogen fixing symbiosis with *Bradyrhizobium* species.

Boundary or barrier or support: It has been frequently planted as a live fence on account of readiness with which it takes root when planted in the ground.

Other services: The wood, seed and flowers were traditionally used in Hawaii, and the tree is integral to many Hawaiian legends and proverbs.

TREE MANAGEMENT

E. sandwicensis should be planted on sites similar to its natural environment. Sites are recommended that have well-drained soil and receive full sun. Planting holes should contain slow release fertilizers and watered once a week for the first month. If watering is not possible or if conditions are particularly harsh, the leaves of the seedlings may be trimmed or the tops cut off entirely.

GERMPLASM MANAGEMENT

To improve germination, seeds should be mechanically scarified by nicking the seed coat and soaking in water (at room temperature) overnight.

PESTS AND DISEASES

E. sandwicensis seedlings may be susceptible to damping-off problems. Powdery mildew fungi will attack the leaves in humid environments. Stem boring caterpillars have caused seedling mortality. Red spider mites are commonly associated with wiliwili. The tree is not suited for areas with high rainfall.

FURTHER READNG

Nakao PL et al. 1993. Soil constraints to the reestablishment of *Erythrina sandwicensis* in an eroded soil in Hawaii. In: *Erythrina in the New and Old Worlds*. Westley SB & Powell MH (eds.). Nitrogen Fixing Research Reports, Special Issue.

NFTA. 1992. *Erythrina sandwicensis* - Unique Hawaiian NFT. Nitrogen Fixing Tree Association 92-06. Waimanalo.

SUGGESTED CITATION

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