Landscape
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Green and Healthy Hawai‘i:

Identifying and Introducing Alternative Ornamental Landscape Plants in Response to Invasive Species Issues

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Introduction

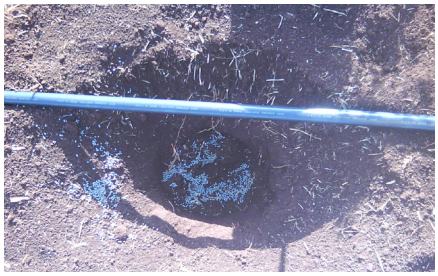
This publication presents data collected from several native and exotic plants over three years at three CTAHR research stations. Two, Waimānalo and Poamoho, are on O‘ahu, and one, Waiākea, is on Hawai‘i Island. These plants were evaluated as potential alternatives to invasive species commonly used in the landscape industry. The graphs in this booklet present the data of a single evaluation, and not an average of the years. Plants that presented significative changes over time, such as notable changes in growth, form, dieback, leaf color, etc., have this information in their description.

Graphs present results by research station and by fertilizer application. When presented by research stations, the results are pooled from 10 replications, 5 fertilized and 5 unfertilized specimens. When fertilizing affected plant growth significantly, the results represent the average of all three research stations, pooling data from 15 plants that received fertilizer and 15 plants that did not.

There are two types of evaluation. In the visual evaluation, each individual plant was evaluated and its aspects of flower, foliage, and overall appearance grade were graded from 1 to 5, being 1 the least desirable and 5 the most desirable grades. For the growth evaluation, plant growth was assessed by measuring height, width, and growth index. The growth index is calculated based on the volume of the plants, from the ground to the top of the plant canopy. For this booklet, the growth index was divided by 3 to facilitate graph reading. Results are presented in feet.

Waimānalo

Represents a mesic site, with dry and hot summers and cool winters. The UH Waimānalo Research Station is located on the Windward side of O'ahu, with predominant trade winds and frequently overcast weather. The soil is shallow, with a high clay content, which gets very sticky and has poor drainage when wet. Irrigation was set to three times per week.

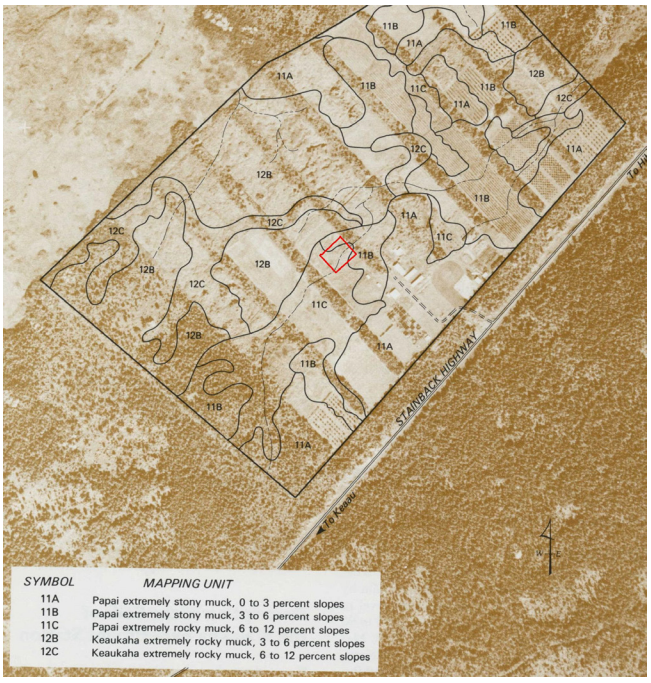


Poamoho

Represents a dry site. It is located on the North Shore of O‘ahu, in an area with very low rainfall. The soil is deep, with very good drainage. The air temperature is hot, and the site is exposed to full sun year round. Most trees did very well in this site, while most shrubs, with shallower root systems, did not survive severe summers. Irrigation was set for once a week.

Waiākea/Hilo

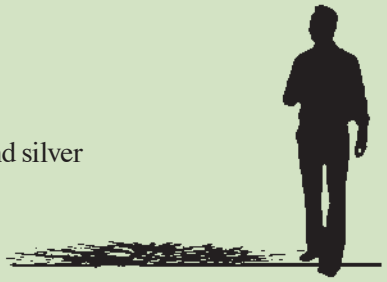
Represents a wet site. Irrigation is not needed there. The soil is very rich in organic matter and very porous, predominantly lava rock. The weather is generally overcast. It has the opposite of Poamoho's conditions.



Metallic Plant

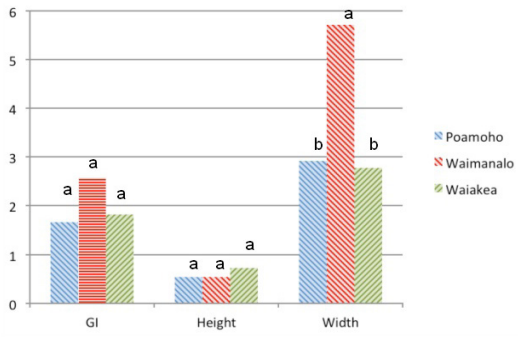
Hemigraphis sp.
Alternative to
Lantana
(*Lantana camara*)

WRA: 1
Accent, ground cover, border
Low – up to 1'
Dark foliage with tones of green, purple, and silver
Tiny white flowers
Water requirement: Regular
Half shade to full shade

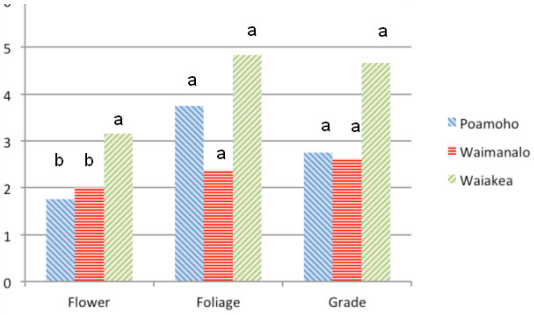


Metallic plant is a low groundcover with dense and dark foliage. The leaves are metallic in the center, with purple borders. The flowers are white, 1 inch across, creating an attractive contrast with the foliage. Metallic plant requires regular irrigation for good results. The leaves easily achieve a permanent wilting point and will drop if exposed to dry conditions with strong sun. Leaves also drop with permanent contact with water; therefore, drip irrigation is preferable to overhead irrigation. It grows better if cultivated in an area with some shade.

Growth evaluation



Visual evaluation

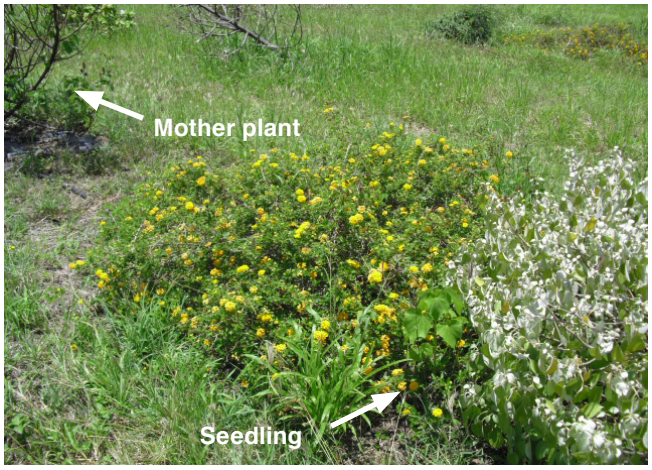


***Hemigraphis* sp. specimens after 1.5 years of evaluation in Waimānalo (left), 2 years in Poamoho (center), and 2.5 years in Waiākea (right).**

'Akiohala

Hibiscus furcellatus
Alternative to
Glorybush
(*Tibouchina* sp.)

WRA: Native, but self-propagated in Waimānalo and Waiākea/Hilo
Barrier plant, screen, high hedge
Medium – up to 12'
Light green foliage
Prickly fruits and branches
Water requirement: Medium to high
Full sun



'Akiohala is indigenous to Hawai'i. It is suitable for use as a barrier hedge or screen due to irritating hairs on the branches and fruits that are very irritant to the skin, causing itching. However, for these reasons, it should be avoided in small areas or in areas where users could have direct contact with plant parts. The foliage is very susceptible to rose beetle damage. Plants cultivated in Waimānalo (mesic) and Poamoho (dry conditions) died 18 months after planting. Plants in Waiākea were very vigorous until the third year and then started to die back. It seems to be a short-lived plant. Seedlings sprouted spontaneously around mother plants, indicating that 'akiohala might demand high weed maintenance; on the other hand, this could be suitable for restoration purposes.

H. furcellatus **specimens after 1.5 years of evaluation in Waimānalo (left) and Poamoho (center) and 2.5 years in Waiākea (right).**

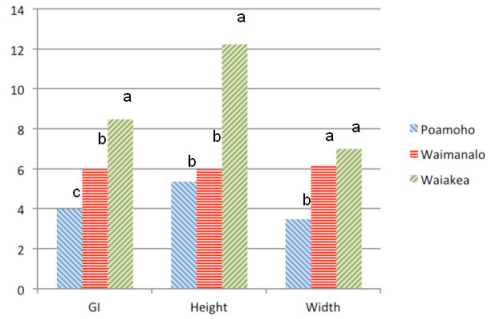
Koki'o

Hibicus kokio

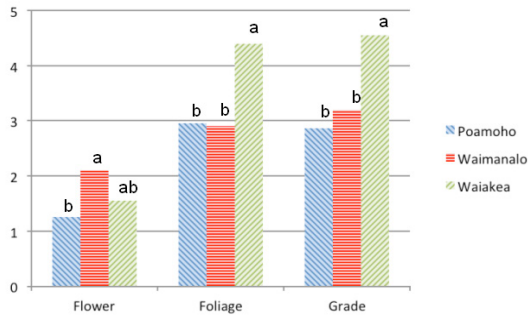
Alternative to Clerodendrum (*Clerodendrum buchanani*)

WRA: Native
Accent, barrier plant, screen, hedge
Medium – up to 12'
Light to dark green foliage
Attractive orange flowers
Water requirement: Low to medium
Full sun

Growth evaluation

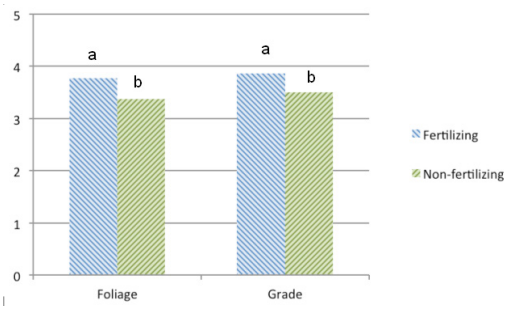


Visual evaluation



Hibiscus kokio is an endemic shrub that can be used as an accent plant or hedge. It has upright growth and dense foliage, with reddish-purple stems that contrast with the light green foliage. The flowers, red, are up to 3 inches in diameter and are produced mainly during spring and summer. Flower color may vary between cultivars. For example, *Hibiscus kokio* ssp. *saintjohnianus* has orange flowers. There are hybrids available as well. Like many other hibiscus, kokio is very susceptible to mites, which affect the foliage because of the galls they create and also retard growth and flowering.

Fertilizer effects



***H. kokio* specimens after 1.5 years of evaluation in Waimānalo (left), 2 years in Poamoho (center), and 2.5 years in Waiākea (right).**

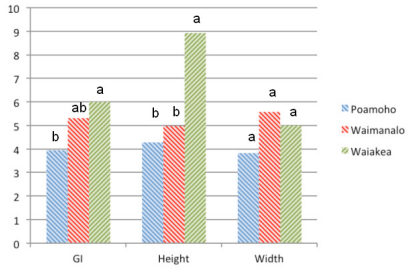
Koki‘o ke‘oke‘o

Hibicus waimeae
Alternative to
Starburst
(*Clerodendrum quadriloculare*)

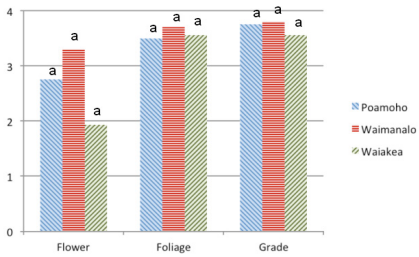
Accent, barrier plant, screen, hedge
Medium – up to 8’
Dark green foliage
Attractive and fragrant white flowers
Water requirement: Medium
Full sun

Hibiscus waimeae is an endemic shrub that can be used as an accent plant or hedge. The big white flowers are fragrant and very attractive. The reddish stamens stand out from the white petals and are eye catching when planted with a dark background. Kokio ke‘oke‘o is a “temperamental” shrub. It requires regular watering for it to flower and maintain nice foliage. However, it is a very tough shrub after it is established in the landscape.

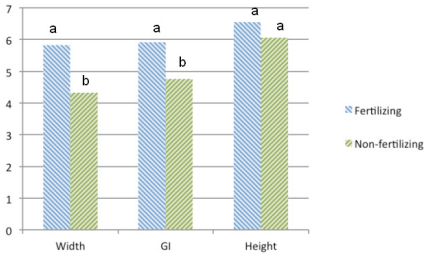
Growth evaluation



Visual evaluation



Fertilizer effects



H. waimeae **specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

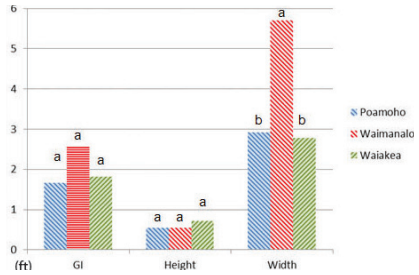
Ixora 'Super King'

Ixora grandiflora
Alternative to
Clerodendrum
(*Clerodendrum quadriloculare*)

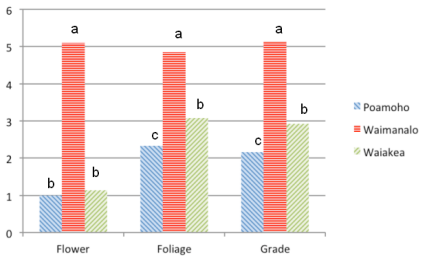
WRA: Not available;
no record of invasive status.
Accent, barrier, hedge
Medium – up to 9'
Dark green foliage
Very attractive red inflorescences
Water requirement: Regular
Full sun to half shade

Ixora 'Super King' can be used as an accent plant and is available in some local nurseries. It could be more frequently used as hedges or individual plants or in groups. It has upright growth with long stems; it is a thin shrub in the first year; however, it branches out and becomes a full shrub after the second year. The exuberant red flower clusters are very ornamental and contrast well with the dark foliage. Susceptible to chlorosis where soil pH is high.

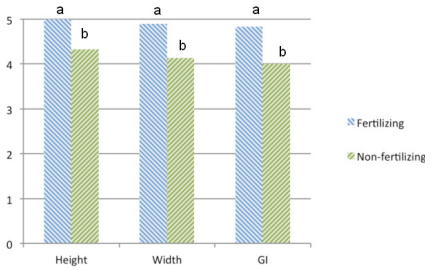
Growth evaluation



Visual evaluation



Fertilizer effects



***Ixora grandiflora* specimens after 1.5 years of evaluation in Waimānalo (left), 2 years in Poamoho (center), and 2.5 in Waiākea (right).**

Giant Crape Myrtle

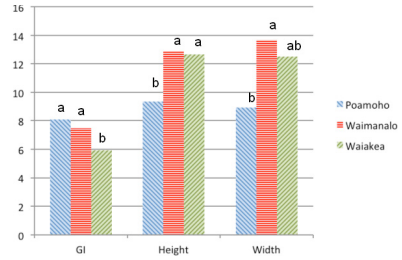
Lagerstroemia speciosa

Alternative to Fiddlewood

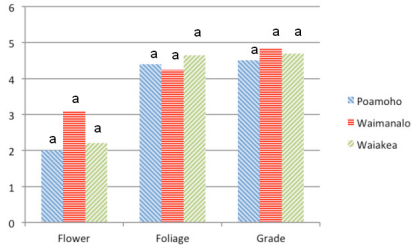
WRA: -4
Shade, accent, street
Medium/large – up to 45'
Light green foliage
Very attractive flowers
Ornamental fruits
Water requirement: Very low
Full sun or half shade

Lagerstroemia speciosa is a tree with a rounded canopy and very ornamental purple and pink flowers. Designers should be aware of the fact that *L. speciosa* drops its leaves throughout summer, causing littering, but this might be a desirable quality insofar as it will provide more light during the winter. Another important aspect of the foliage is the color of new shoots, which are reddish to purplish and very ornamental.

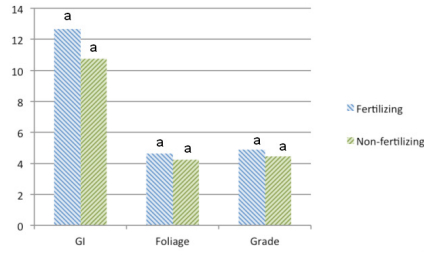
Growth evaluation



Visual evaluation



Fertilizer effects



Lagerstoemia speciosa **specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

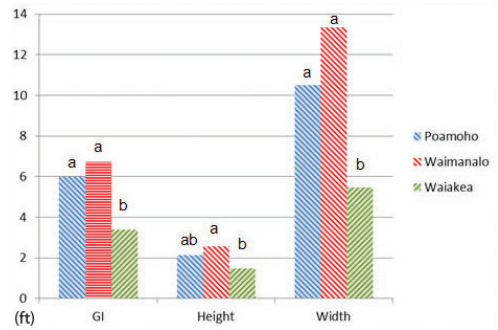
Lantana 'SunGold'

Lantana cv. 'SunGold'
Alternative to
Lantana
(*Lantana camara*)

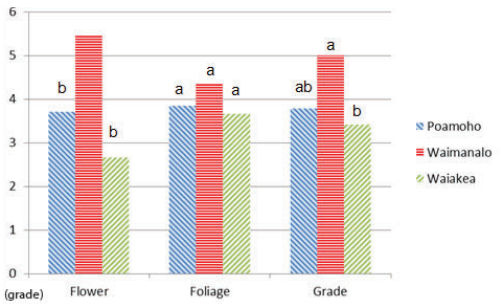
WRA: Not applicable
(seedless cultivar *L. camara*: 32)
Accent, ground cover, border
Low – up to 3'
Dark green foliage; attractive yellow flowers
Water requirement: Very low
Full sun

Lantana camara is a well-known invasive plant and is also widely used in the Hawaiian landscape industry. Fortunately, several seedless hybrids have been released by seed companies. The seedless cultivar 'SunGold' has bright golden yellow flowers and a crawling habit. It performed very well in all of the three research stations, with the best results in Waimānalo. Lantana 'SunGold' grows very fast as a ground cover, easily reaching up to 8 feet diameter in the first year. However, no seedlings were produced at any site from this cultivar. Annual trimming promotes new growth with abundant flowers and improves visual quality by removing dry stems and flowers.

Growth evaluation



Visual evaluation



***Lantana* cv. 'SunGold' specimens after 1.5 years of evaluation in Waimānalo (left), 2 years in Poamoho (center), and 2.5 years in Waiākea (right).**

Kului

Nototrichium sandwicense

Alternative to *Ligustrum* spp.

WRA: Native

Hedge, edge, container, specimen

Medium – up to 5'

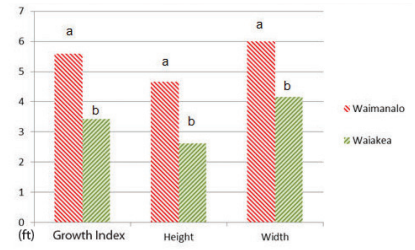
Very ornamental silver foliage

Water requirement: Low

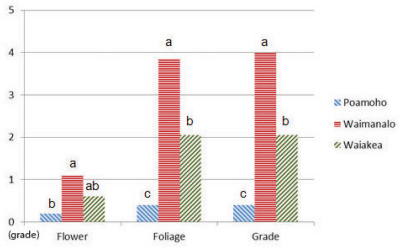
Full sun

Kului is native to Hawai'i Islands. It is suitable for use as an accent shrub and in edges. The leaves have a silvery coat when exposed to full sun. In the shade, the leaves are light green. Stems and foliage may rot in environments that are too moist. Kului is excellent to create sharp contrasts with dark backgrounds. Its growth rate is moderate, and it requires low water when established in the landscape. The branches split easily at nodes; therefore, it should be handled carefully. It is susceptible to mealybugs, especially when cultivated in the shade. Fertilizing promotes plant growth significantly (see graph).

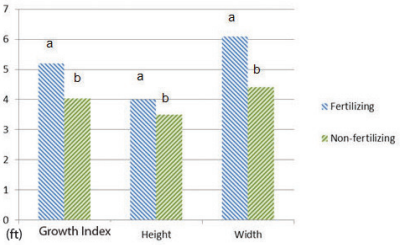
Growth evaluation



Visual evaluation



Fertilizer effects



***Nototrichium sandwicense* specimens after 1.5 years of evaluation in Waimānalo (left) and 3 years in Poamoho (center) and Waiākea (right).**

'Akia

Wikstroemia uva-ursi

Alternative to

Lantana

Lantana camara

WRA: Native

Groundcover, edge, bush, container, specimen

Small/medium – up to 2'

Attractive red berries

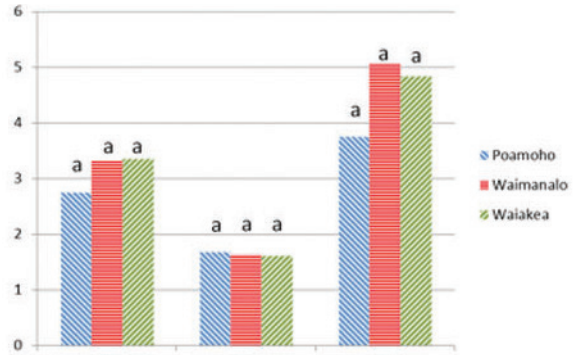
Pale yellow flowers

Water requirement: Low

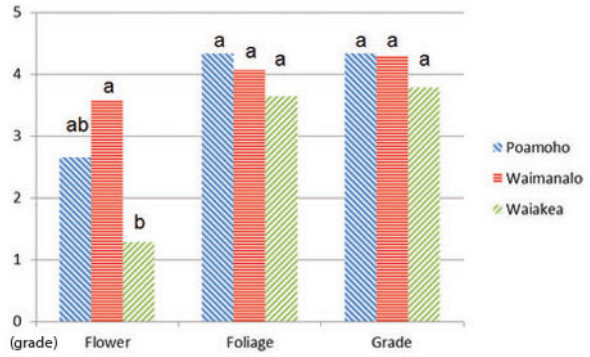
Full sun

'Akia is native to O'ahu, Moloka'i, and Maui. It has been cultivated as a ground cover or small edge. The leaves have a bluish tone and contrast with dark vegetation, such as mondo grass or uki-uki. It is also a good companion to pohinahina. It has slow growth and requires very low maintenance. The branches break easily, so it should be handled with care. The fruits should not be eaten. 'Akia may drop its leaves if exposed to extreme drought; therefore, the soil should be watered before it dries out. The leaves will regrow if watered soon after a drought. It is also susceptible to dieout in poorly drained soils.

Growth evaluation



Visual evaluation



***Wikstroemia uva-ursi* specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

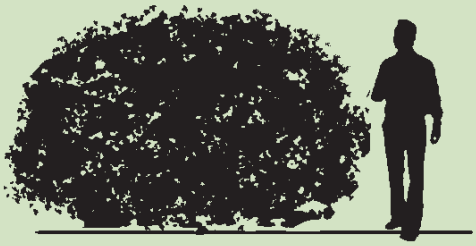
‘A‘ali‘i

Dodonea viscosa

Alternative to

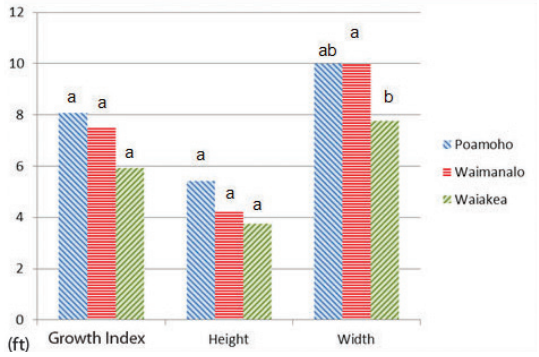
Cassia suratensis

WRA: Native
Accent, barrier, hedge, screen
Medium – up to 9’
Light green foliage
Attractive fruits
Water requirement: Very low
Full sun or half shade

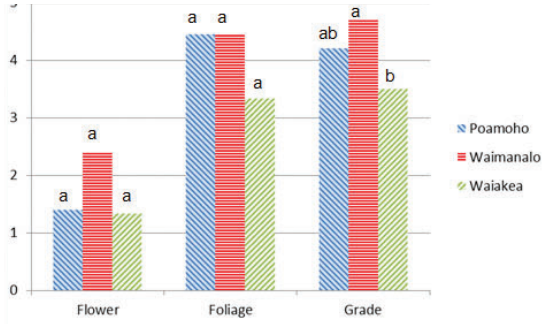


Dodonea viscosa is a species indigenous to Hawai‘i. It thrives in a wide array of conditions: on volcanic and mountain slopes, at low elevations, in partial to full sunlight, and in soils of many types. It also tolerates strong winds. ‘A‘ali‘i is tolerant of dry to wet conditions; however, it requires good drainage. The fruits, shown above, are very attractive and are used in lei. Growth habit varies considerably because of propagation by seeds.

Growth evaluation



Visual evaluation



Dodonea viscosa **specimens after 3 years of evaluation in Waimānalo (left) and Poamoho (center), and after 2.5 years of evaluation in Waiākea (right).**

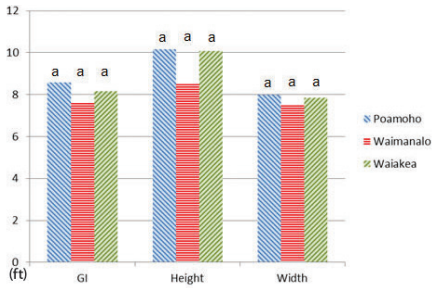
Tulipwood

Harpullia pendula

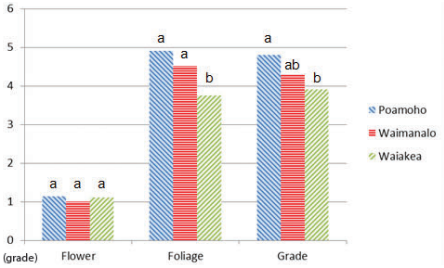
WRA: -4
Specimen, street, small shade
Low to medium – up to 30'
Green foliage
Orange fruits – ornamental
Water requirement: Low
Full sun

Harpullia pendula is a small tree that has been used as street tree in Hawai'i, especially on sidewalks and in parking lots. It has a bright trunk, ornamental inflorescences and attractive foliage with reddish young leaves. Despite the large amount of fruits produced by *H. pendula*, there is no record of this tree as an invasive species.

Growth evaluation



Visual evaluation



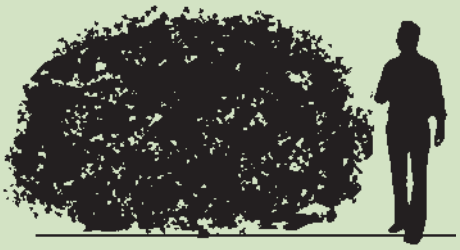
***Harpullia pendula* specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

Naio

Myoporum sandwicensis

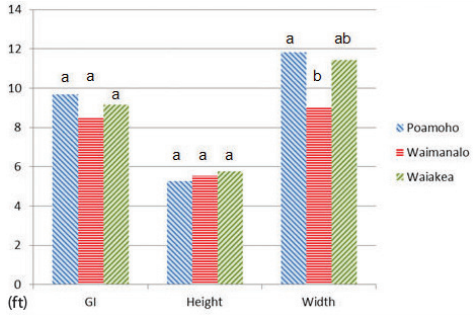
Alternative to *Nerium oleander*

WRA: Native
Screen, barrier, hedge
Low to medium – up to 9’
Green foliage
Fragrant white flowers
Water requirement: Low
Full sun

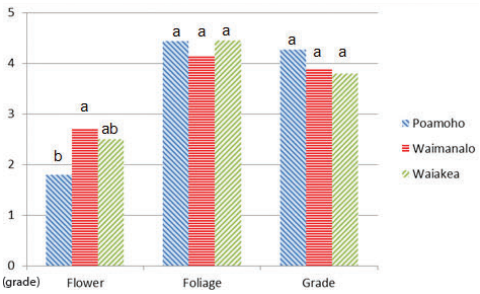


Naio is a large shrub or small tree endemic to all islands of Hawai‘i except Kaho‘olawe. It is usually found in coastal environments and has been cultivated in both wet and dry places; however, the soil should have good drainage. The flowers are fragrant, with a honey-like smell. The leaves have somewhat sharp tips and should be avoided in major circulation areas, such as along busy walkways.

Growth evaluation



Visual evaluation



***Myoporum sandwicensis* specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

Jaboticaba

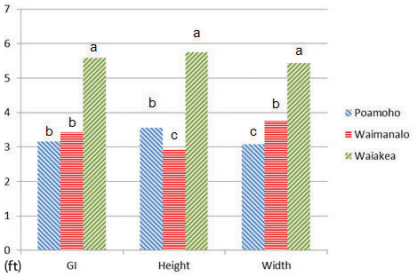
Myrciaria cauliflora

Alternative to
Strawberry guava
(*Psidium cattleianum*)

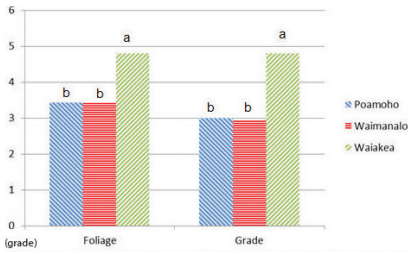
WRA: -2
Shade, accent, street
Medium – up to 12'
Dark green foliage
Edible fruits
Water requirement: Regular to high
Full sun

Jaboticaba is a tree from the Atlantic forest, native to Brazil. It is very ornamental, with smooth bark and fine foliage. It tolerates drought between watering and wet seasons; however, it requires abundant water to grow. Therefore, it should be planted only in areas with high rainfall, such as the Windward side of the Hawaiian Islands. Jaboticaba is also sensitive to strong winds. The edible fruits are very ornamental and can be eaten fresh or used for jellies and other recipes.

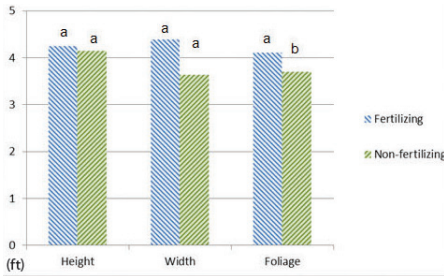
Growth evaluation



Visual evaluation



Fertilizer effects



***Myrciaria cauliflora* specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

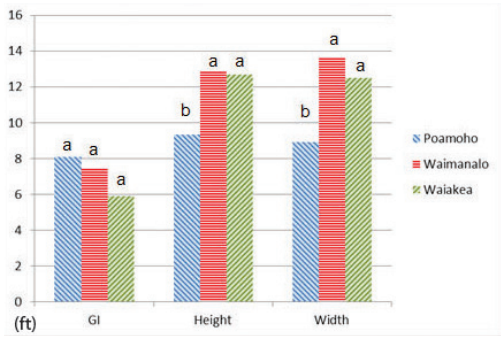
Alahe'e

Psydrax odorata

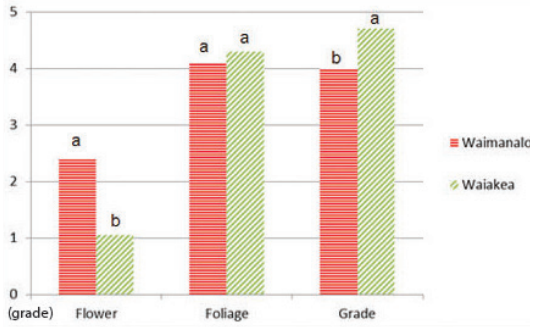
Alternative to Allspice (*Pimenta dioica*)

WRA: Native
Shade, park
Medium – up to 30'
Dark green foliage
White and fragrant flowers
Water requirement: Low
Full sun

Growth evaluation



Visual evaluation



Psydrax odorata, whose Hawaiian name is alahe'e, is a shrub or small tree, ranging from coastal areas to moist forests. It has dark and glossy green leaves, white and gray bark, and fragrant white flowers. Usually the plants present upright growth, somewhat pyramidal. Alahe'e is drought resistant; however, it requires regular watering and fertilizing after planting. After establishment, plants require less or no irrigation and less frequent fertilizing.

***Psydrax odorata* specimens after 3 years of evaluation in Waimānalo (left) and Waiākea (right).**

'Ohe makai

Polyscias sandwicensis

Alternative to

Strawberry guava

(*Psidium cattleianum*)

WRA: Native

Specimen

Low to medium – up to 70'

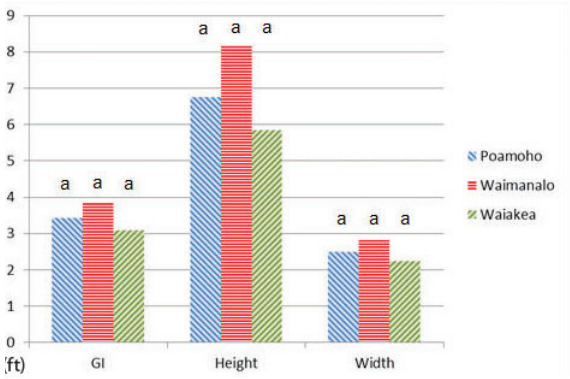
Green foliage

Orange fruits – ornamental

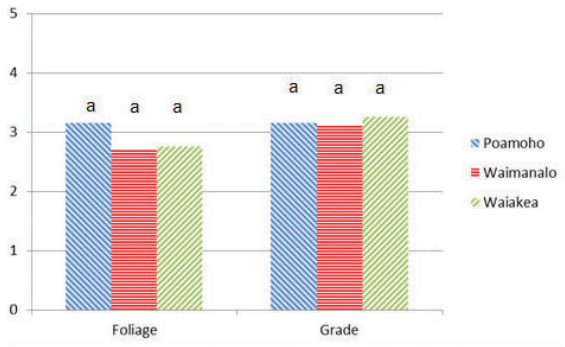
Water requirement: Low

Full sun

Growth evaluation



Visual evaluation



Polyscias sandwicensis is a native plant reaching 65 to 70 feet tall, slow growing, with straight trunk and spreading canopy. It has a smooth bark, and its leaves are greenish-yellow with orange stems, and the young leaves are purplish. It is a tree uncommon in the urban landscape.

***Polyscias sandwicensis* specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

Lonomea/Kaulu/ Manele

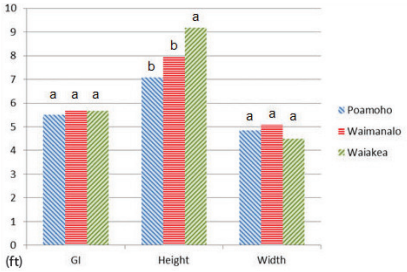
Sapindus oahuensis, *Sapindus saponaria*

Alternative to Fiddlewood

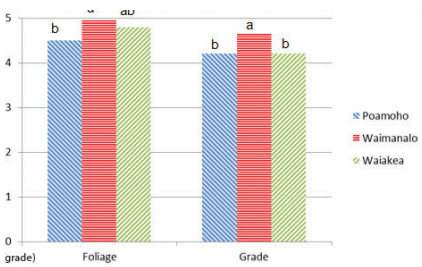
WRA: native
Shade, park
Medium – up to 50'
Dark green foliage
Soapy fruits – not recommended for paved areas
Water requirement: Low
Full sun

Sapindus spp. is a tree native to Hawai'i that has been used in landscapes, especially in institutional gardens. It has a light trunk that contrasts with the dark foliage (see picture to left from UH Pearl City Urban Garden Center). It demands low or no watering at all. The fruits are soapy. Therefore, this tree should not be used along paved areas. Also, there is a borer that attacks young stems. Besides that, *Sapindus* spp. is an excellent tree to be used in larger areas.

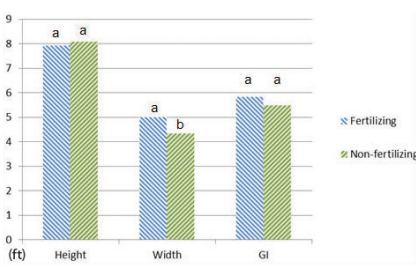
Growth evaluation



Visual evaluation



Fertilizer effects



***Sapindus* sp. specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

Lechoso – Gardenia tree

Stemmadenia litoralis

Alternative to

Psidium cattleianum

WRA: 5

Street, container, shade, specimen

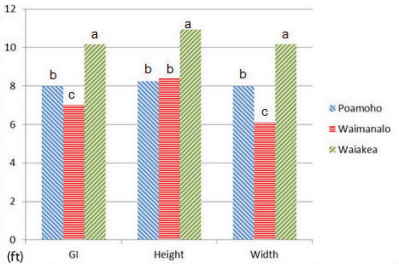
Small/medium tree – up to 20'; canopy: 12'

Attractive and fragrant white flowers

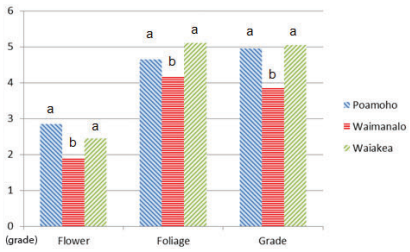
Water requirement: Medium, tolerates drought

Full sun

Growth evaluation



Visual evaluation



Lechoso is native to Central and South America. It has been cultivated in Hawai'i as a small or medium tree, especially along walkways and in courtyards. Because of its vase-like shape and easy care, delicate trunk and glossy leaves, lechoso works very well as an alternative to strawberry guava. The fragrant white flowers are very ornamental and are produced year round. It may drop its leaves if exposed to extended drought.

***Stemmadenia litoralis* specimens after 3 years of evaluation in Waimānalo (left), Poamoho (center), and Waiākea (right).**

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