


**"Unfortunate Forestry Introductions to Hawaii"**  
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Unfortunate forestry introductions to Hawai'i  
Valuable trees which have become ecological and economic pests  
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*Falcataria moluccana*,  
aka *Paraserianthes falcataria*,  
*Albizia falcataria*  
albizia

All trees are good. Many valuable and useful trees have been planted in Hawai'i for forestry projects but have escaped cultivation and become ecological and economic pests. One of the worst of these is albizia, scientific name *Falcataria moluccana*, also known as *Paraserianthes falcataria* and *Albizia falcataria*

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- Huge trees
- One of the fastest-growing the in the world
- Used for lumber, pulp, agroforestry
- Nitrogen-fixer (organic farmers, permaculturists)

Albizia is a huge tree and one of the fastest growing trees in the world. The wood is used for pulp and paper in many tropical countries and the tree is used for coffee shade and in other agroforestry systems. Being a nitrogen-fixer, it helps to enrich the soil. Permaculturists and organic farmers are particularly attracted to nitrogen-fixing trees.

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But... also one of the worst pests  
Currently invading and destroying wet native 'ōhi'a forest in Puna, O'ahu, and Kaua'i  
Causing financial problems for Puna homeowners



ALBIZIA  
THE TREE THAT ATE PUNA  
April 2001

However, albizia has become one of Hawaii's worst invasive species. It has the ability to invade intact 'ōhi'a forests in Puna, O'ahu, and Kaua'i, where it overtops the native trees and shades them out. It facilitates invasion of strawberry guava (*Psidium cattianum*) in the understory and may even create habitat for coqui frogs. It is also an economic burden. Huge albizia trees that break easily in storms are a hazard for nearby houses and roads.

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*Grevillea robusta*,  
silk oak, silver oak


- Prime timber
- Fast growing
- Drought tolerant



Silk oak is another great forestry species that has been widely planted in Hawai'i. Silk oak is fast growing, adapted to dry leeward and cool sites, and produces a beautiful timber.

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But... pest of rangelands and invader of endangered dryland forests



Pu'u Wa'a Wa'a

Silk oak spreads rapidly, however, and is a pest on ranches where it shades out forage grasses and in native dryland forests where it competes with rare native trees such as lama (*Diospyros sandwicensis*) and sandalwood (*Santalum ellipticum*).

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*Casuarina equisetifolia*,  
short leaf ironwood

- Windbreak
- Salt tolerant
- N-fixer




Ironwoods (*Casuarina* spp.), particularly *Casuarina equisetifolia*, are prized as windbreaks and as trees that will grow in coastal sites where no other trees will. They also fix nitrogen and flourish on poor soils.

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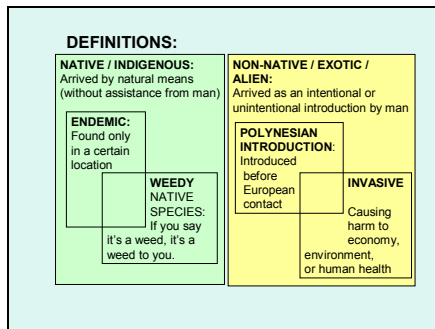
*But... significant cost to rehabilitate lands dominated by Casuarina*

- \$365/acre cost of mechanical and chemical control
- Plantation establishment costs increased by 28%
- Loss of productive land in windrows



Although ironwoods have been used as a windbreaks for decades, they invade unmanaged land and forms dense thickets. Clearing these thickets has a high economic cost. It cost one company \$365 per acre for mechanical (with a bulldozer equipped with a shear blade) and chemical control of ironwood on former cane lands. This increased their plantation establishment cost by 28%. They also lost the use of the land where the wood was windrowed.

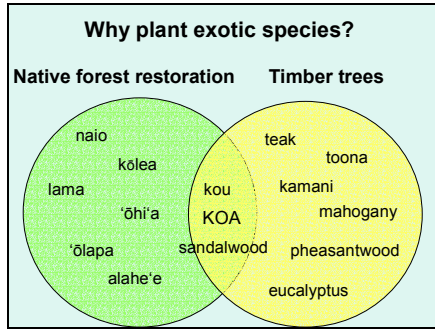
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Some definitions are in order. Native or indigenous trees arrived by natural means (hitchhiking on birds, blown on the wind, or carried in the ocean waves) without assistance of man. 'A'alii, *Dodonea viscosa*, is an example of an indigenous tree that is native both to Hawai'i and many other places in the tropics. Endemic trees are a subset of indigenous trees. These evolved in a certain location and are found only there. Koa and 'ōhi'a are both endemic to Hawaii and found nowhere else. Native trees may be weeds, if they interfere with agriculture or other land uses. Non-native, alien, or exotic trees are those that people brought to a place. A special subset of these trees are those like kukui (*Aleurites moluccana*) and kamani (*Calophyllum inophyllum*) in Hawaii that the aboriginal Polynesian settlers brought with them. Invasive plants are those non-native plants which cause either economic or ecological harm. Most alien species are not invasive.

Graphic by Katie Friday, USDA Forest Service Institute of Pacific Islands Forestry.

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Why plant exotic species? Few native Hawaiian trees are suitable for timber. Koa (*Acacia koa*) is the main species that serves both purposes. In some areas, kou (*Cordia subcordata*) and sandalwoods (*Santalum spp.*) may also work as native trees that yield marketable wood. Other than those species, choices are limited to native trees that don't yield marketable timber or exotic trees. Of course, many different tree species can be grown on one farm.

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**Actions to take... demonstrations**

*Dalbergia sissoo* (Indian rosewood) scored high on invasiveness (WRA=16, High risk, HPWRA)

At the forestry demonstration plots, we cut it and replaced it with *Calophyllum inophyllum* (kamani)




Extension and outreach workers can take several actions to guide clients in avoiding invasive species. First of all, outreach programs should not promote invasive species, either in literature or in demonstrations. When the forestry extension program found that Indian rosewood (*Dalbergia sissoo*) planted in a demonstration plot was a potential invasive species, it was cut down and replaced with a non-invasive tree (kamani, *Calophyllum inophyllum*).

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**Actions to take... Recommend alternatives**

*Acacia mangium*

- N-fixer
- Adaptable, fast growing
- Merchantable wood
- No HWRA rating but...



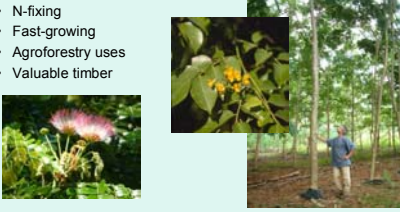
<i>Acacia auriculiformis</i>	Darwin Black Wattle	13 H (HPWRA)
<i>Acacia confusa</i>	Formosan koa	10 H (Hawaii)
<i>Acacia crassicaarpa</i>	northern wattle	7 H (HPWRA)
<i>Acacia farnesiana</i>	sweet acacia	14 H (HPWRA)
<i>Acacia longifolia</i>	Sidney goldern wattle	10 H (HPWRA)
<i>Acacia mearnsii</i>	Australian acacia	15 H (Hawaii)
<i>Acacia melanoxylon</i>	Australian blackwood	12 H (HPWRA)
<i>Acacia nitida</i>	gum arabic tree	14 H (HPWRA)
<i>Acacia parramattensis</i>	Parrmatta green wattle	9 H (HPWRA)

Extension and outreach workers need to be able to recommend alternatives to invasive species. Although *Acacia mangium* is not yet rated by the Hawaii Weed Risk Assessment system, all other non-native *Acacia* species are potentially problem invaders and it is likely that mangium also will prove invasive. The advantages of mangium is that it is a fast-growing nitrogen fixer with merchantable wood.

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**Functional alternatives**

- N-fixing
- Fast-growing
- Agroforestry uses
- Valuable timber



*Samanea saman*, monkeypod  
HWRA = 4, low


*Pterocarpus indicus*, narra  
HWRA = 4, low

Alternatives are trees that provide the same products or services that invasive species do but are not invasive. In stead of *Acacia mangium*, growers might want to plant either monkeypod (*Samanea saman*) or narra (*Pterocarpus indicus*), both fast-growing nitrogen-fixing species with low risk of becoming weedy.

## Slide 13

**Actions to take... biocontrol**

- *Psidium cattlium*, strawberry guava
- Edible fruit, ornamental
- Still sold in garden shops
- Biocontrol: *Tectococcus* gall wasp



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Another long-term solution for invasive forestry trees that have already become established is introduction of bio-control agents. *Tectococcus* gall wasps are a potential bio-control for strawberry guava, *Psidium cattlium*.

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**Proposed CTAHR guideline**

Don't plant an invasive species when another plant will do.

