

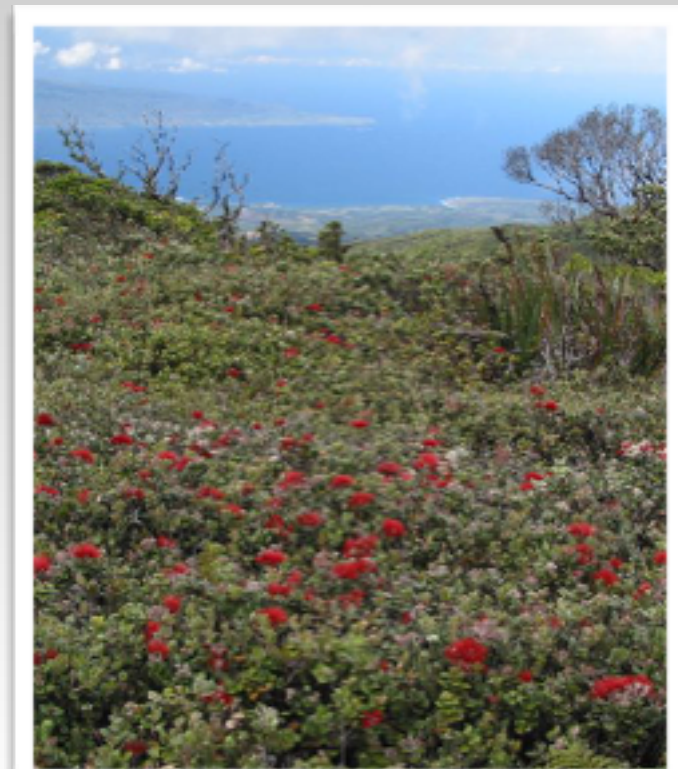
The Propagation and Production of 'Ōhi'a lehua (*Metrosideros polymorpha*) for Retail, Landscape and Reforestation



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‘Ōhi‘a lehua *Metrosideros polymorpha*

- Family: **Myrtaceae** Genus: ***Metrosideros***
50 species Philippines, New Guinea, New Caledonia, New Zealand, Pacific Islands including 5 species recognized in Hawai‘i from a single colonizing event
- Species: ***M. polymorpha*** has eight recognized varieties ranging from shrub to tall tree
- Occurs low to high elevations, generally wet conditions, ecological role as pioneer species and forest canopy species
- Red, yellow, or orange flowers sporadically throughout the year but heavy flowering in spring and early summer



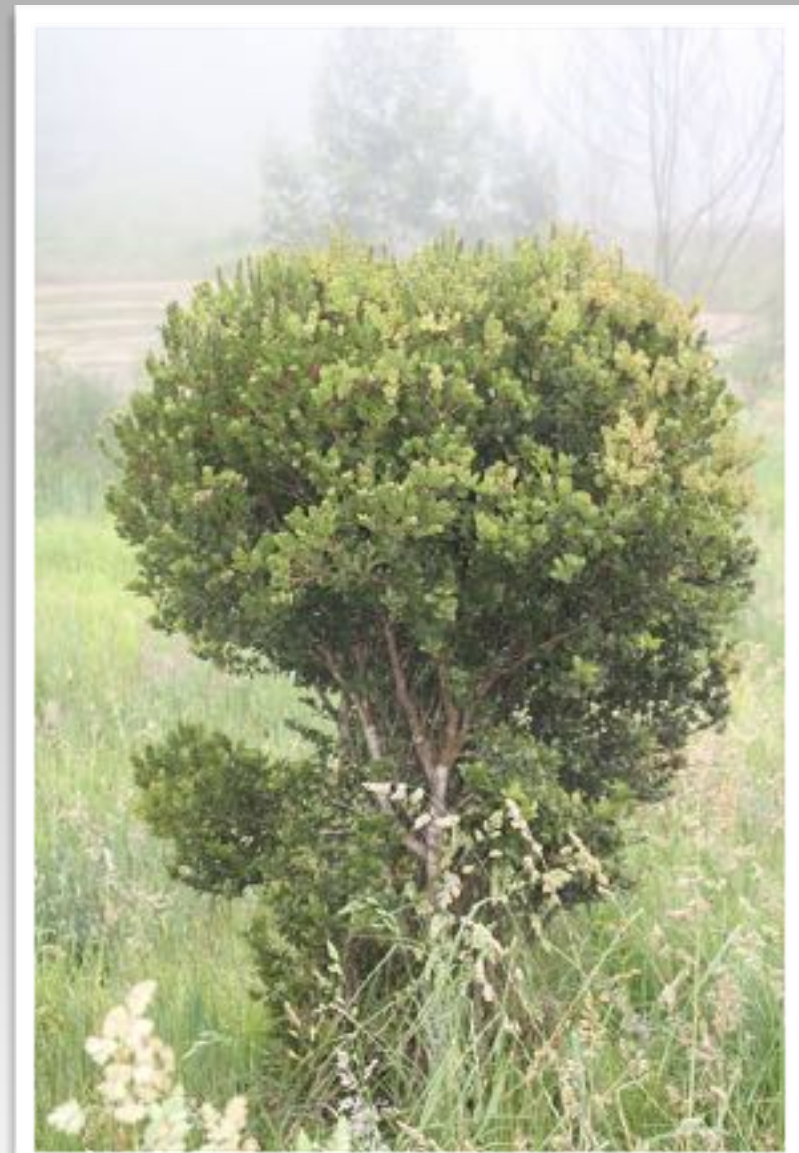
Why the Propagation and Production of ‘Ōhi‘a lehua is worth talking about...

- Great candidate for landscaping with native plants...
serves as a **specimen tree** or **shrub**



Why the Propagation and Production of ‘Ōhi‘a lehua is worth talking about...

- Major component of reforestation efforts and habitat restoration



Reforestation with Koa (*Acacia koa*) and ‘Ōhi‘a lehua (*Metrosideros polymorpha*)

Why the Propagation and Production of ‘Ōhi‘a lehua is worth talking about...

- Necessary development of resistant types to newly introduced plant diseases:



<https://cms.ctahr.hawaii.edu/rod/>

‘Ōhi‘a rust *Austropuccinia psidii*

Rapid ‘Ōhi‘a Death (ROD) *Ceratocystis sp*

Why the Propagation and Production of ‘Ōhi‘a lehua is exciting for a horticulturalist ...

- Due to diverse eco-regions of the Hawaiian Islands and the inherent diversity of each wild seed source, the opportunity for horticultural selections are vast
- Open-pollinated crosses from distant sourced individuals have shown some exceptional offspring
- Vegetative propagation allows for production of improved stock for retail and landscape markets

Diversity of Flower and Leaf



Propagation of 'Ōhi'a lehua from seed



Seeds are tiny and best sown fresh



Seeds dehisce in the fall from dried capsules



Seeds are sown on the surface of well drained media



Seedlings are transplanted out of seed flat @ 2 months



6" of growth @ 8 months



Overhead fertigation and sub-irrigation in full sun to finish off

Propagation of 'Ōhi'a lehua from cuttings



Healthy, vigorous mother stock with juvenile growth



Semi hardwood cuttings with leaf area reduced



Dip n Grow® 1:5 quick dip or Hortus IBA® 200ppm 24 hr soak



100% medium perlite in deep cutting trays



Intermittent mist system and shade ($\sim 200 \mu\text{mol m}^{-2} \text{s}^{-1}$)



Rooted cuttings ready in 6-10 weeks

Notes on the Production of ‘Ōhi‘a lehua container stock

- Seeds should germinate in 1-3 weeks if viable
- Moderate light levels for seed flats and recently transplanted seedlings
- High light levels for seedling growth phase and hardening off
- Well draining media, allow drying out between waterings, don't bury the stem during transplanting of seedlings or rooted cuttings
- Decrease or eliminate overhead irrigation if ‘Ōhi‘a rust emerges, control with fungicides: Eagle® 20EW, Paegent®, Cleary 3336® rotation
- Prevent ants from nesting in pots
- Control aphids, rose beetle with insecticides: Safari®, Core-tect®

**Some seedling selections of ‘Ōhi‘a lehua
from wild seed sources that show
exceptional qualities for landscape markets**



**‘Maukanani’ is an extremely vigorous and
columnar tree with prolific red flowers**

**Some seedling selections of ‘Ōhi‘a lehua
from wild seed sources that show
exceptional qualities for landscape markets**



**‘Kaheawa’ is an extremely low growing
sprawling shrub with purple, silvery foliage
and small red flowers**

**Some seedling selections of ‘Ōhi‘a lehua
from wild seed sources that show
exceptional qualities for landscape markets**



**‘O‘ahu small leaf’ is a hardy, sprawling tree
that can be pruned into a hedge with
numerous small, red flowers and small leaves.**

Some F₁ seedling selections of ‘Ōhi‘a lehua that show exceptional qualities for retail markets



‘Cherry red’ has nice flower buds and deep red flowers. The 1 gallon potted specimens were treated with the plant growth regulator, Cycocel® (800 ppm foliar), to shorten internode length for a more compact plant.

F₂ seedling traits of 'Ōhi'a lehua flowers from open-pollinated distant sourced F₁ parents



**F₂ seedlings
from 'Jon's orange'
resulted in:**

**Very large,
indeterminate,
paniculate
flower
inflorescence**



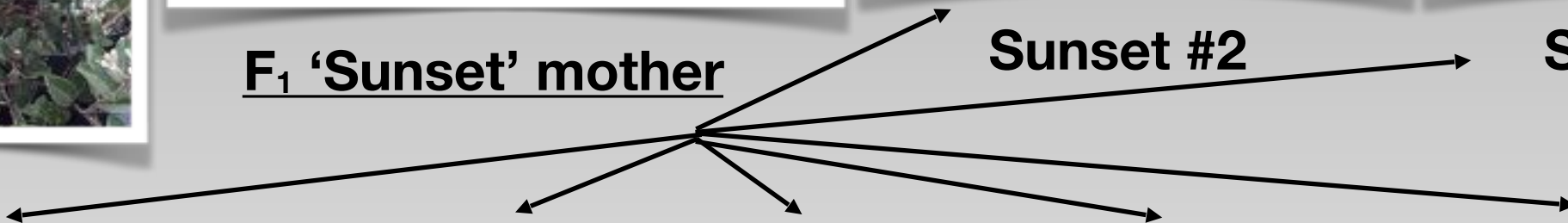
‘Ōhi‘a lehua hybrids from open-pollinated distant sourced individuals



F₁ ‘Sunset’ mother

Sunset #2

Sunset #3



Sunset #4

Sunset #5

Sunset #6

Sunset #7

Sunset #8

Cultivar	Flower color	Form	Bloom month	Source	Rust resistance	Mother stock	Notes
Cherry nani				Cherry red F2 seedling		N	
Cherry red	red	vigorous tree	feb march april may	Kanalo F1 seedling		Y	big and fast
Crimson	crimson red		april may	Kanalo F1 seedling		N	multi branched fast
Ed's upper Yellow	orange/yellow	columnar medium	april may	Kanalo seedling		Y	fuzzy silver leaves
Honu nui				?		N	
Jon's orange	orange	average shrubby	march	Kanalo F1 seedling		Y	shrubby at first
Kaheawa	red	very low sprawling shrub	march	West Maui seedling		Y	
Kanalo yellow	yellow	medium tree		Kanalo seedling		Y	slower growing
Kawena	yellow			Jons orange F2		Y	
Kawena shrubby	yellow			Jons orange F2		N	pendant branches
Kawena2	yellow			Jons orange F2		N	
Kawena3	yellow			Jons orange F2		N	big bloom clusters
Kawena4	yellow		march	Jons orange F2		N	
Kawena5	yellow			Jons orange F2		N	
Kawena6	yellow			Jons orange F2		N	
Kawena7	yellow			Jons orange F2		N	
Kula Manu	yellow	vigorous large shrubby tree	april may	Big Island seedling		Y	fast growing
Mana ulu	yellow	skinny columnar	feb march	Ulupalakua cutting		Y	columnar
Manamamo				Mana ulu F1		N	
Maukanani	red	vigorous columnar	may june	Kanalo seedling	good	Y	columnar fast
Meadow Gold	yellow		march april	?		N	
Nanu ohia	red	medium vigor thick growth		West Maui seedling	good	Y	green leaves heavy blooms
Oahu small leaf	red	vigorous, thick	june july	Oahu seedling		Y	small rd blooms
OG	reddish orange			Jons orange F2		N	
OG2	reddish orange			Jons orange F2		N	nice liko
OG3	orange		april	Jons orange F2		N	
OG4	reddish orange			Jons orange F2		N	
OG5	orange			Jons orange F2		N	
OG6	orange		april	Jons orange F2		N	

Deliberate crossing to produce 'Ōhi'a lehua hybrids



**Emerging
stigma
with anthers to
be removed**



**Deliberate cross-
pollination**



**Stigmas covered
after deliberate
cross**



Seed filled capsules

**We have just started these deliberate crosses
and will grow out the offspring next year...**



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