

Air Layering: an old practice with new system for Tropical Fruits and Native Plant Preservation



Joe DeFrank - UH-Manoa
Tropical Plant and Soil Science – 12/10/2020



Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

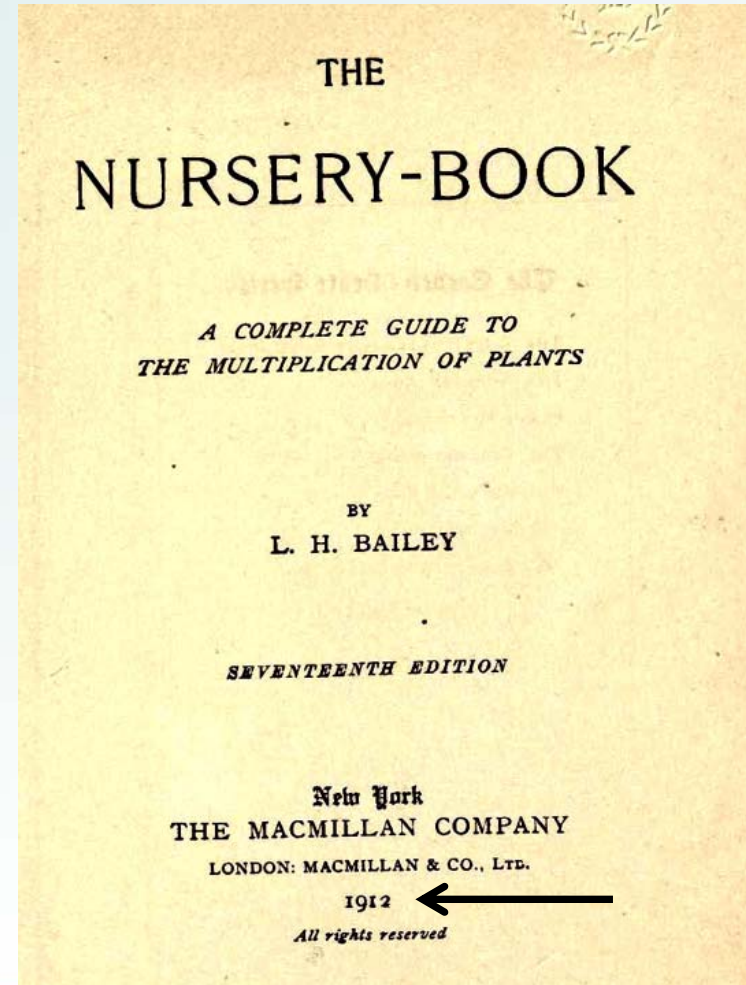
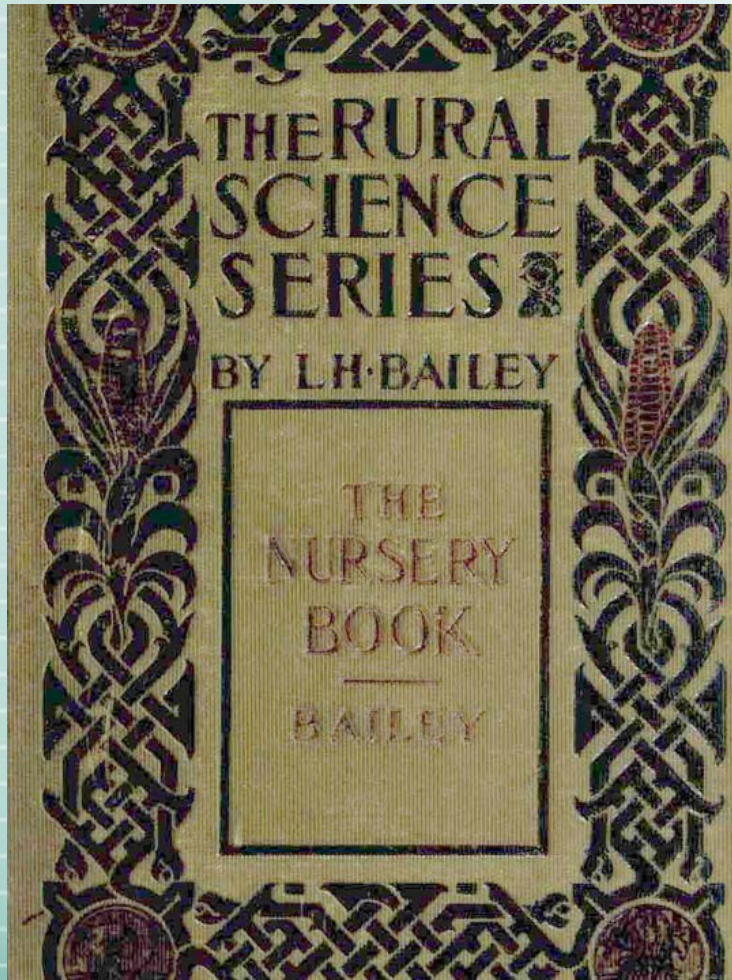
Topics Covered

- **What is air-layering**
- **Review of air layer art in patent records**
- **Improving air layer results with new materials and methods**
- **Air layering: suggestions for international fruit breeding exchanges and native plant preservation**

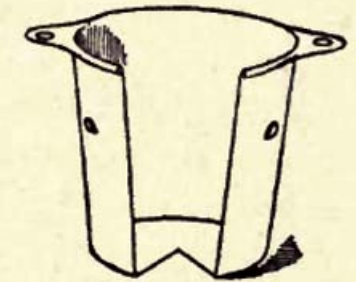
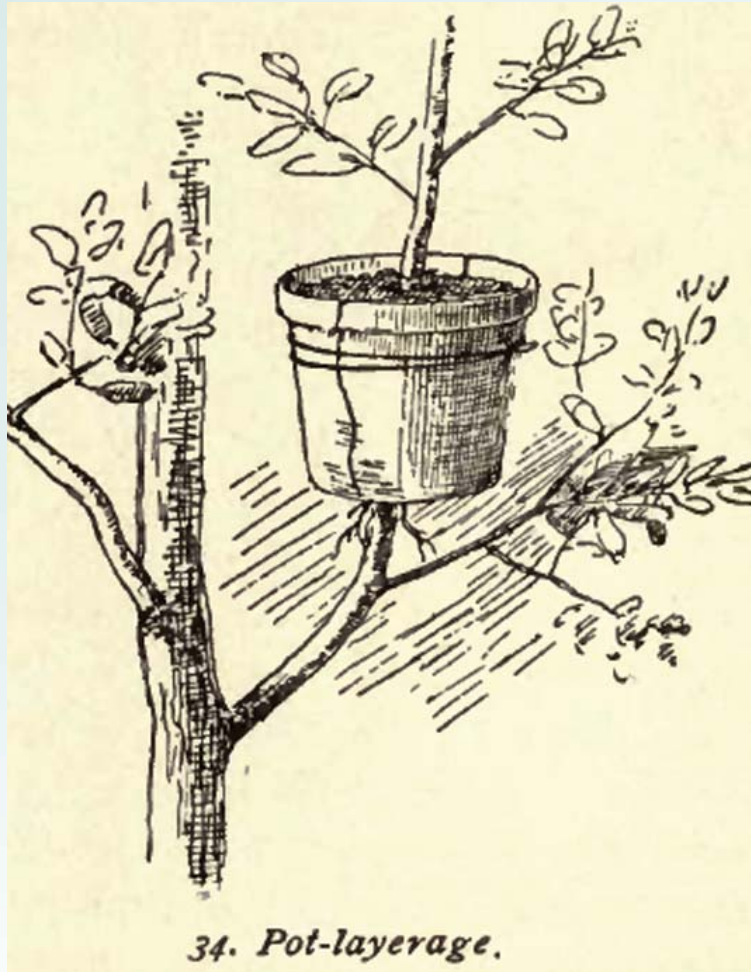
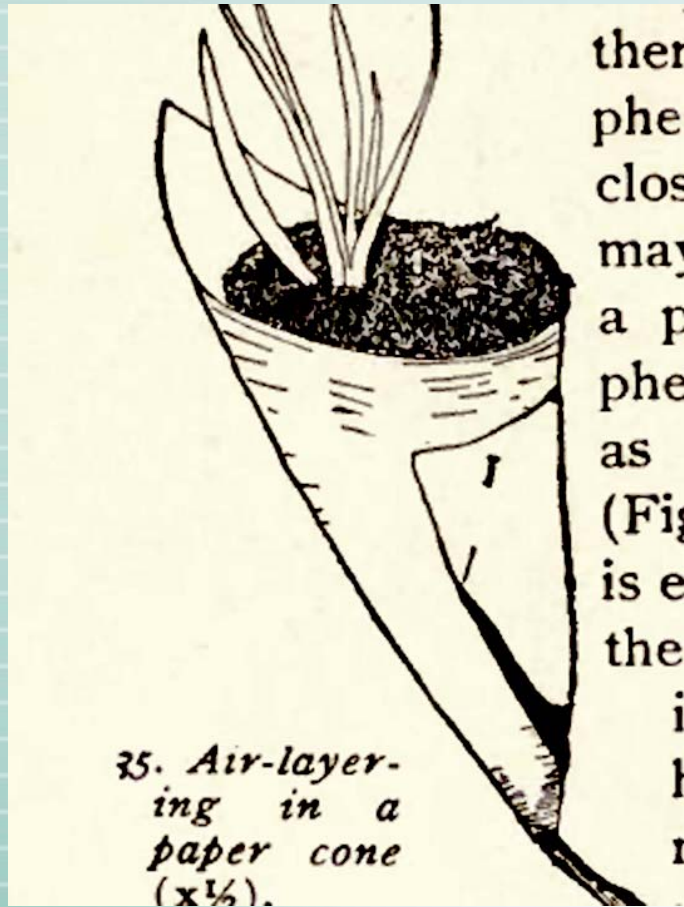


What is Air-layering

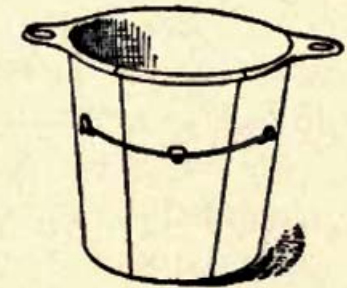
Liberty Hyde Bailey – 1858 - 1954



What is Air-layering



pot, provided with
side to receive the

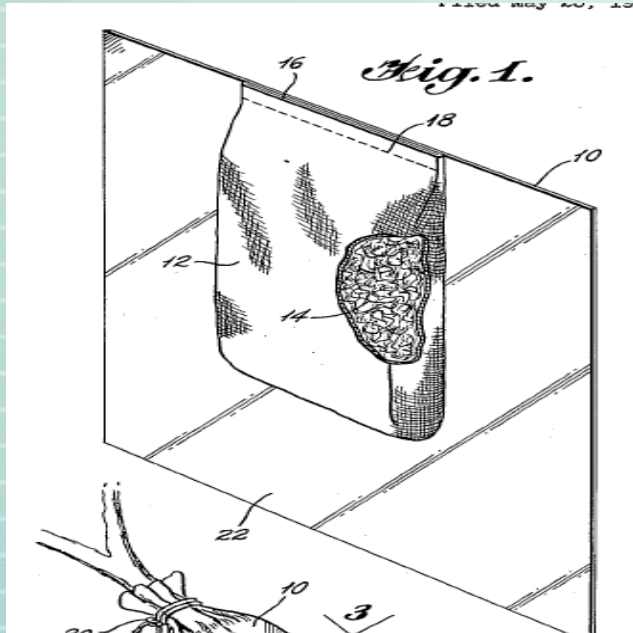


Making roots grow from stems

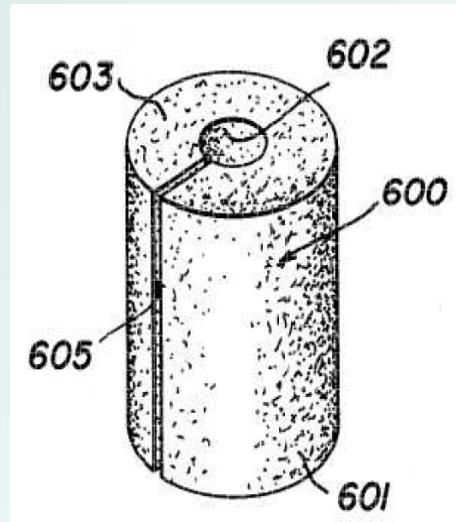


Review of air layer arts

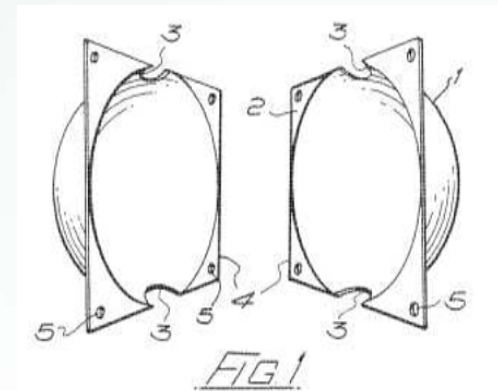
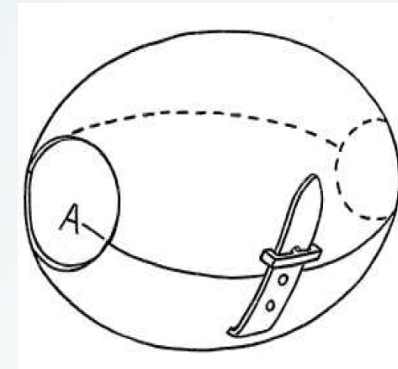
Cotton gauze bag
attached to clear plastic
sheet



Slit tube of hydrophilic
polymer as growth media



Plastic shell w/clasp
filled with growth
media



Local air layer method with media in bags

Images courtesy Dr. Ken Leonhardt-UH TPSS



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Standard approach to air layering and issues observed



1. Time consuming to prepare moss on film strips
2. Sealing ends w/string caused inconsistent results
3. Ants invaded rooting media and causes rots
4. Opaque film = Uncertainty of root formation
5. Working off the ground, hard to apply film wraps



Woody stem is ready to air layer ?
Insure active growth and barks slips easily

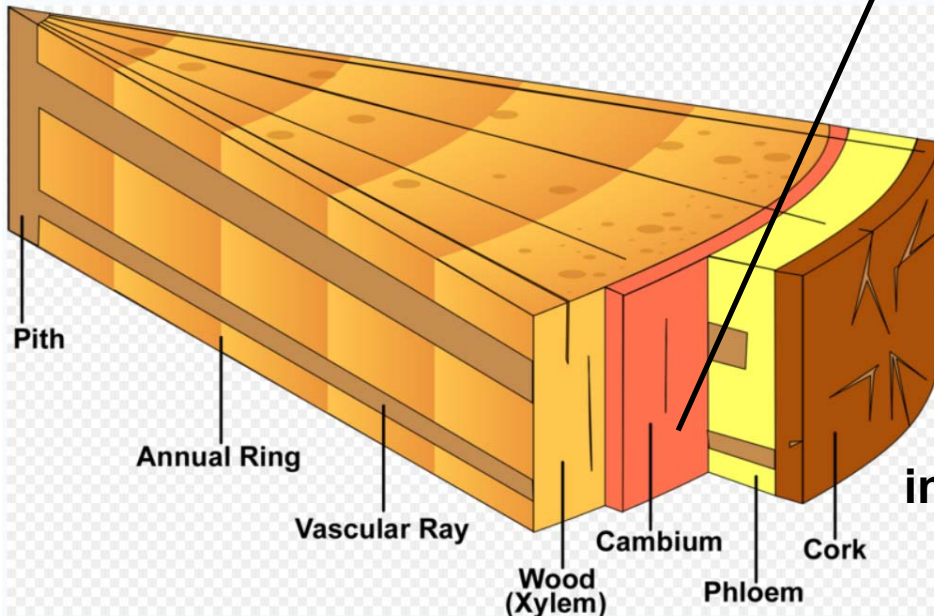


Fruits and flowers = not optimum growth stage for air layering

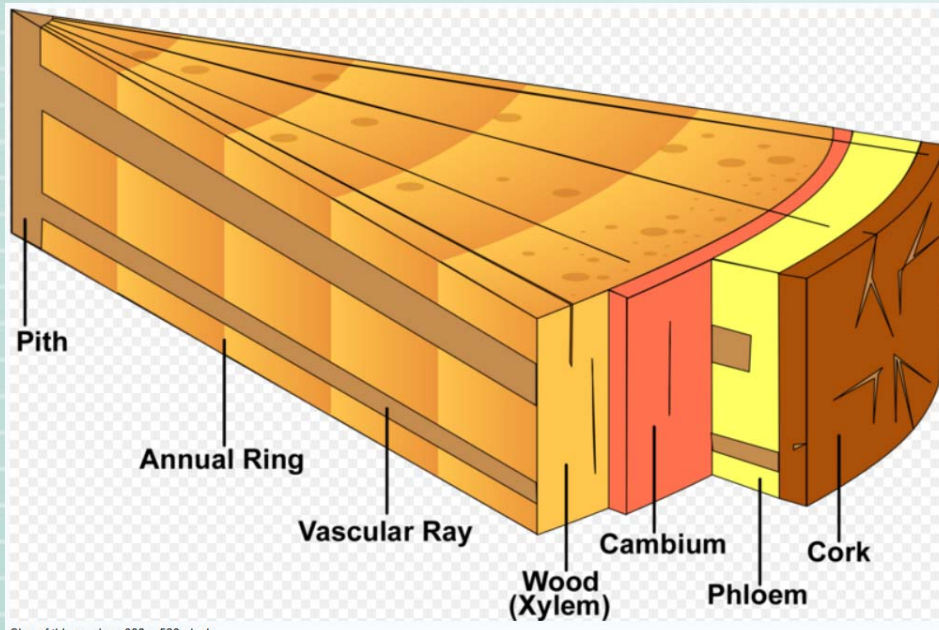


Woody stem is ready to air layer ?

Insure active growth and barks slips easily



Remove cambium layer to prevent reconnection of phloem. Block needed to retain hormones and nutrients at root initiation zone. Need to expose woody stem



Groves increase surface area for hormone action



- **Cut through cork (bark) and cambium layers at a angle with serrated knife**
- **Angled cut insures exposure of proper stem layer for hormone induction of root growth.**
- **Serrated knife provides maximum hormone surface area with groves from knife**





**Smooth side of
knife faces the
person preparing
the root initiation
zone**



**Make groves in root initiation zone by laying the
deeply serrated side of knife against the stems
Increases surface area for rooting hormone.**



Use a brush to apply hormone powder to groves in stem at the root initiation zone



0.8% Indol -3- butyric acid (Hormodin 3)

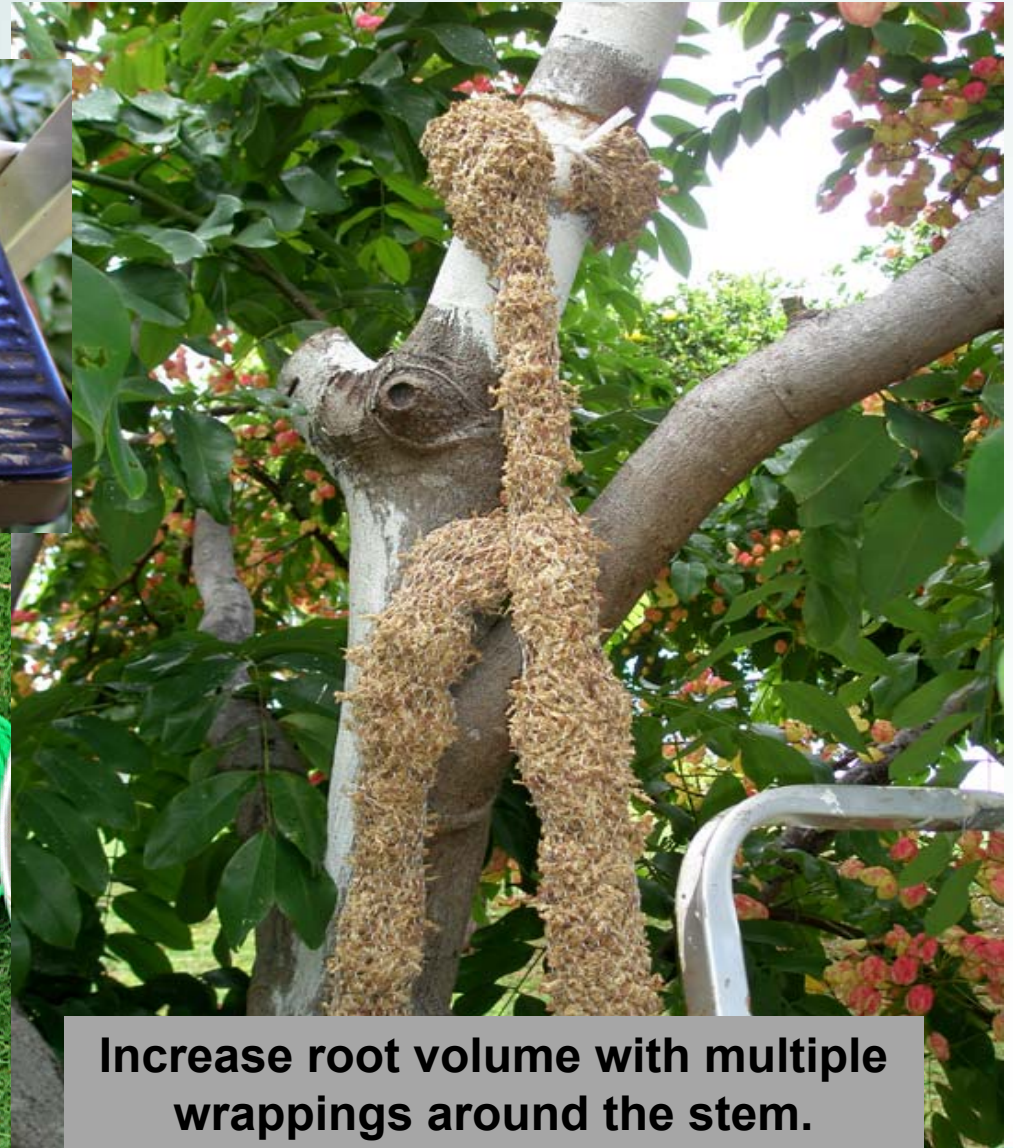


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**Fill net sack with sphagnum moss,
for hands free film application**



**Long media filled sack for
branches of various size**



**Increase root volume with multiple
wrappings around the stem.**





Contact information

Long roll of netting at local food service company
KYD Inc

PO Box 29669

Honolulu, HI 96820-2069

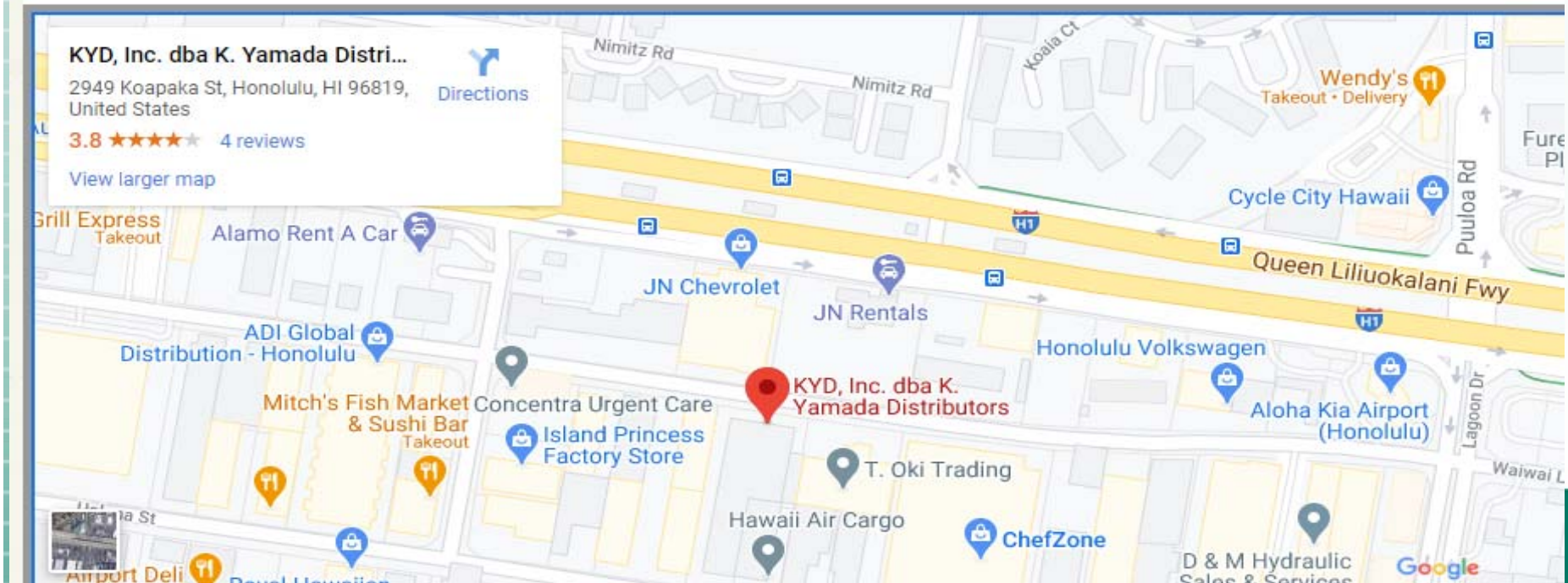
Our headquarters is located at 2949 Koapaka Street, Honolulu,
Hawaii 96819

And Our manufacturing facility is located on Umi Street in Kalihi
(808) 836-3221

Fax: **(808) 833-8995**

info@kydinc.com

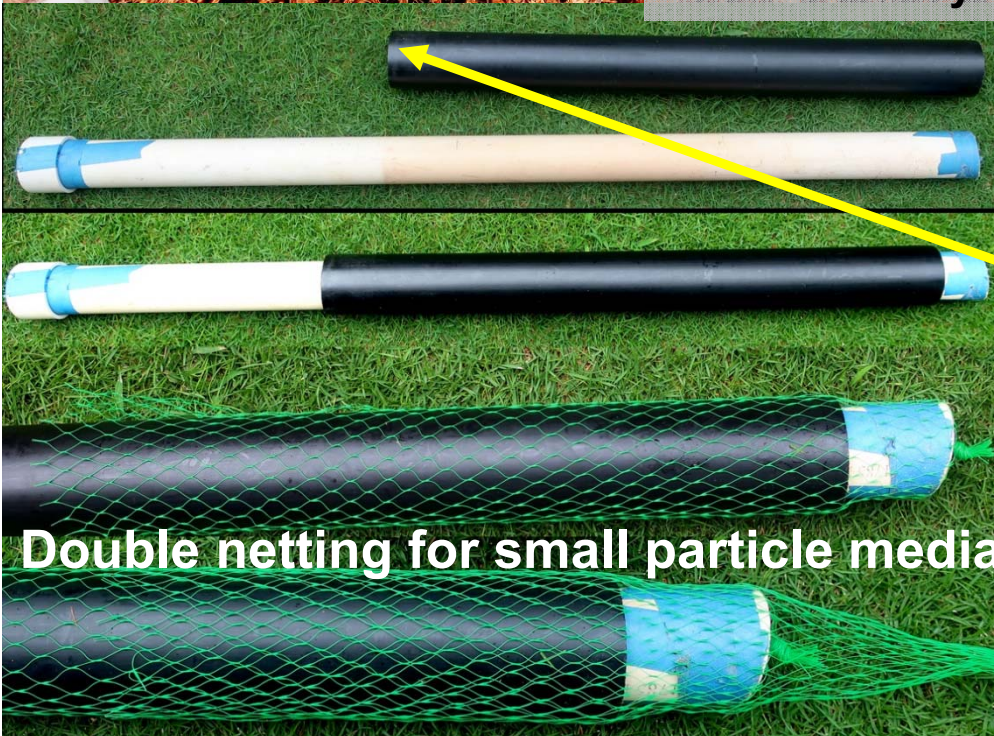
kwong@kyd-inc.com



Coconut coir



Use coconut coir to mix with expensive S-moss
Soak first to remove salts and inhibitory compounds



Double netting for small particle media



Sevin 5% Dust applied to sphagnum moss rooting media to prevent ant invasion which reduce air layer success



ORNAMENTAL SHRUBS AND FLOWERS

For outdoor use only. To kill bagworm, blister beetles, boxelder bug, boxwood leafminer, flea beetles, Japanese beetle, lacebugs, leafhoppers, leafrollers, periodical cicada, plant bugs, psyllids, rose aphid, rose slug, scale insects in the crawler stage, tent caterpillars and exposed thrips, apply thoroughly to the infested plants at the first sign of damage. Do not repeat application more than once weekly or more than 6 times per year. For best results on scale, apply in spring and early summer when scale crawlers are present.



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Net sack held to stem with opened paper clip



Shrink wrap secures media for strong root growth, chop stick inserted into the net sack provides a path for water drainage



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Clear shrink wrap needs to be covered with Al-foil, new roots turn black with light exposure.



Use tape to prevent shrink wrap from unraveling



Use chop stick to provide drainage, Located at low spot of wrap



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Colored Uline Bundle Wrap 80 gauge, 5" x 1,000', Black



[Enlarge](#)

1" diameter extended core is less bulky and easier to handle.

- Built-in disposable handle is ready to use right out of the box.
- High quality Uline cast film.
- Colors for fast product identification.

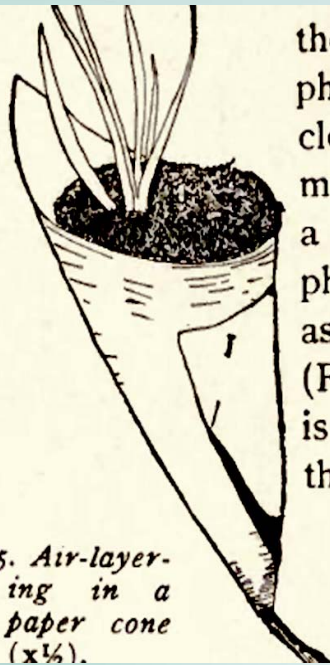
SPECIFY COLOR:

SOLD IN CASE QUANTITIES

MODEL NO.	SIZE	CORE	GAUGE	ROLLS/ CASE	LBS./ CASE	PRICE PER ROLL				COLOR	IN STOCK SHIPS TODAY
						12	36	72	144+		
S-17968BL	5" x 1,000'	1"	80	12	20	\$9.75	\$9.25	\$8.75	\$7.95	■ Black ▾	<input type="text" value="12"/> rolls <input type="button" value="ADD"/>



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35. Air-layering in a paper cone (x1/4).



Opening at top side accommodates stem swelling during root formation
requires ant control and drainage



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Removed from mango 03/18/11

Estb. 07/07/11

Estb. 07/07/11

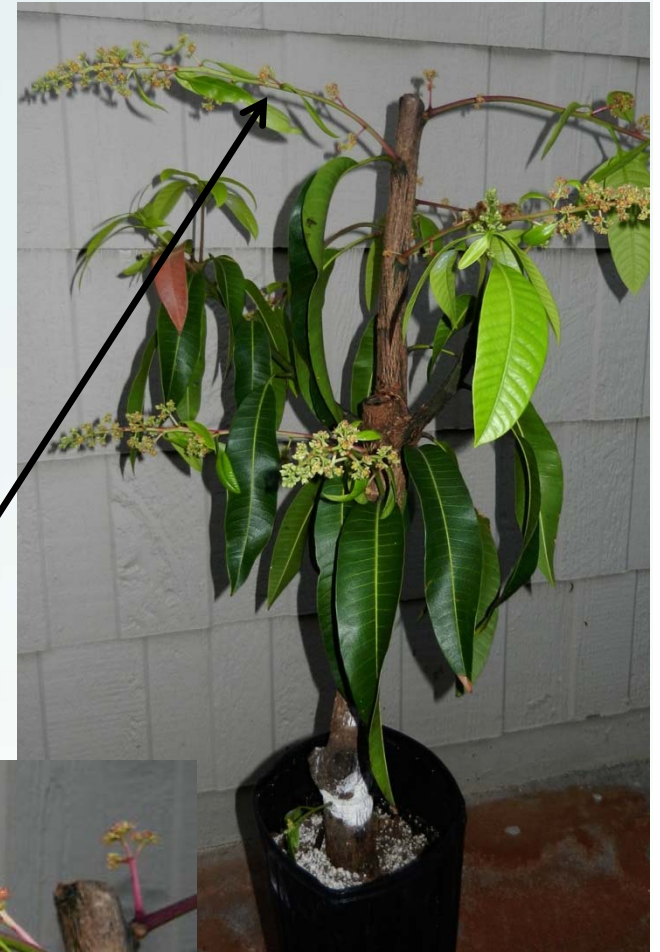


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**Prolific root growth
and flower production
allows for
Bench-top pollination
& breeding exchanges**

**Soilless root ball good
for phytosanitary
treatments and
shipments**



Air layering to recover elite Koa/Ohia germplasm to establish accessible seed nurseries



Koa root sucker



Koa layer w/roots



Koa Layer in ground



For more information on topics covered

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