

# Air Layering: An Old Practice with a New System for Tropical Fruits and Native Plant Preservation



**Joe DeFrank - UH-Manoa  
Tropical Plant and Soil Science**



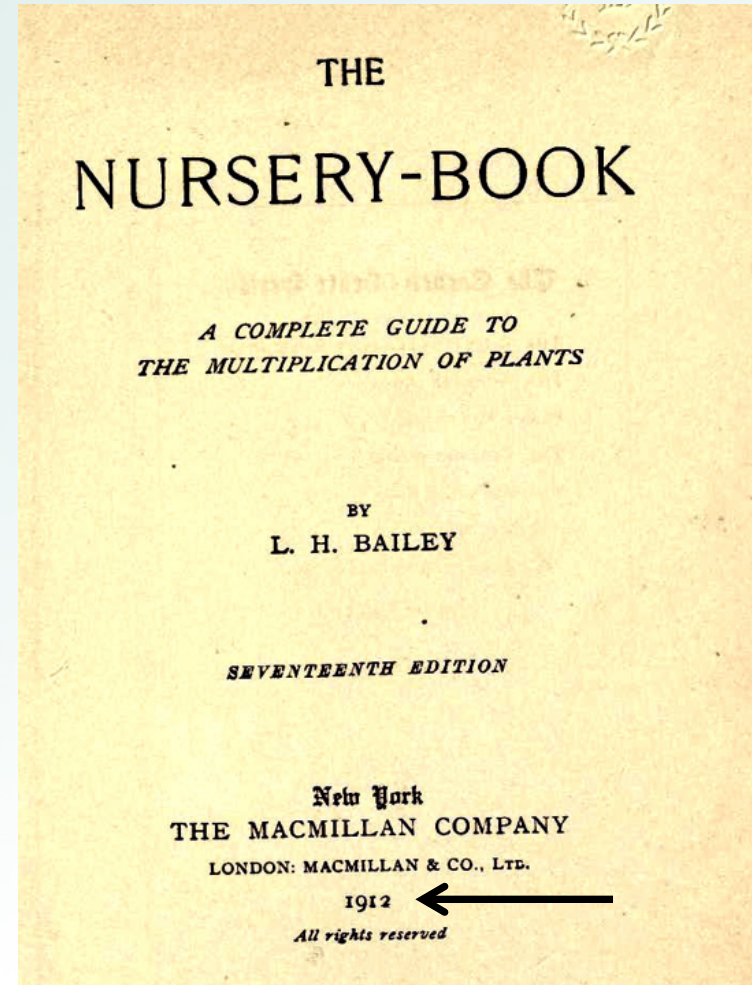
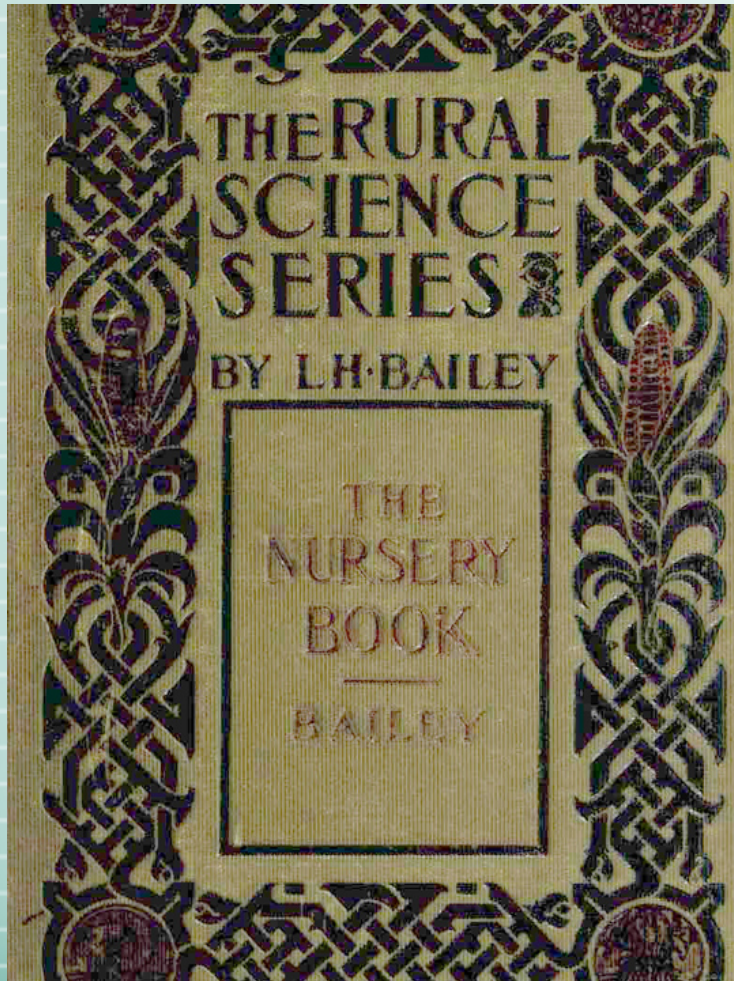
# Topics Covered

- **What is air-layering**
- **Review of air layer art in patent records**
- **New air layer system developed in HI.**
- **Air layers for international fruit breeding exchanges and native plant preservation**

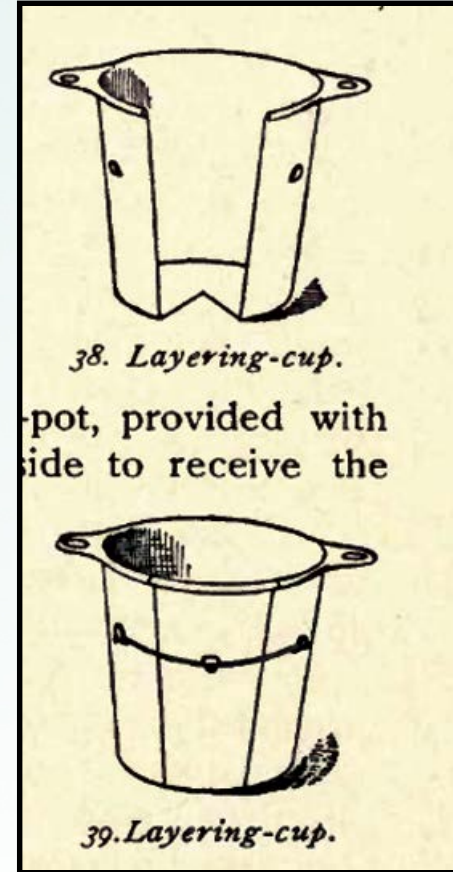
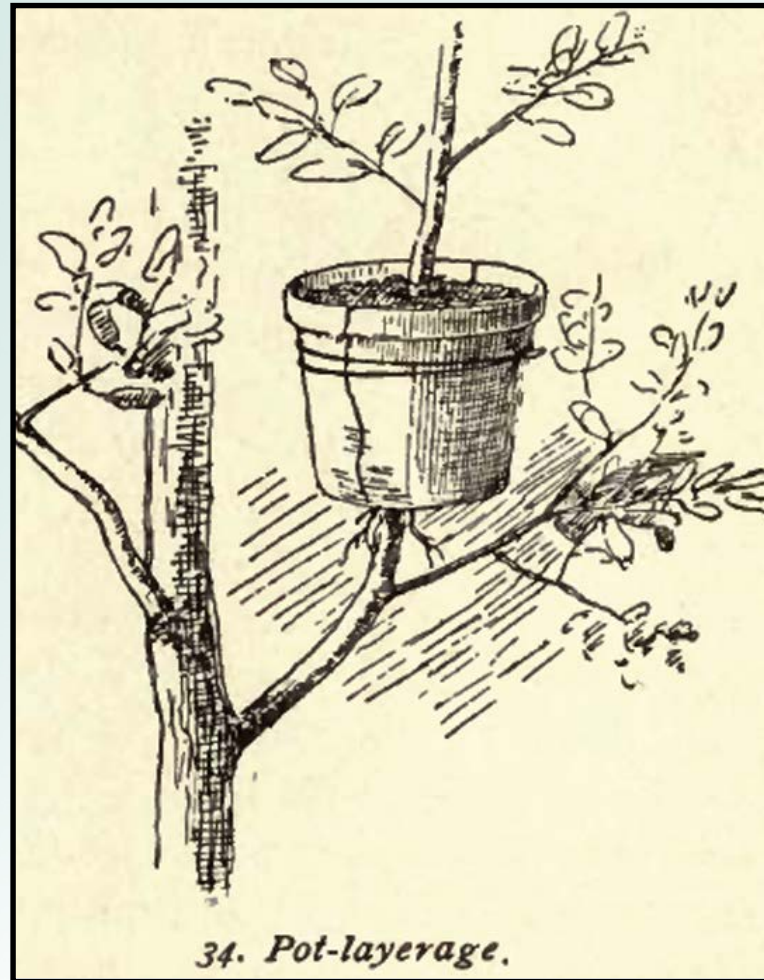
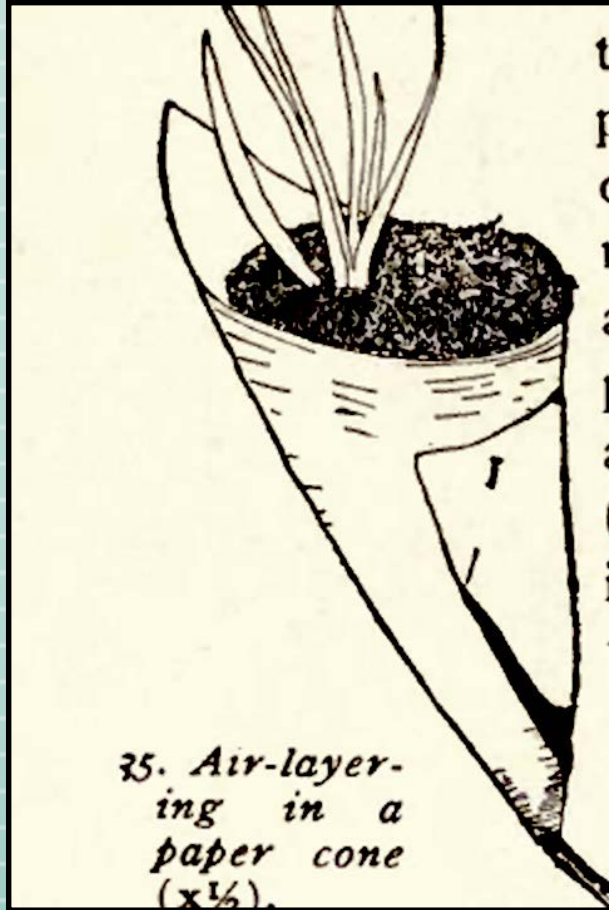


# What is Air-layering

Liberty Hyde Bailey – 1858 - 1954

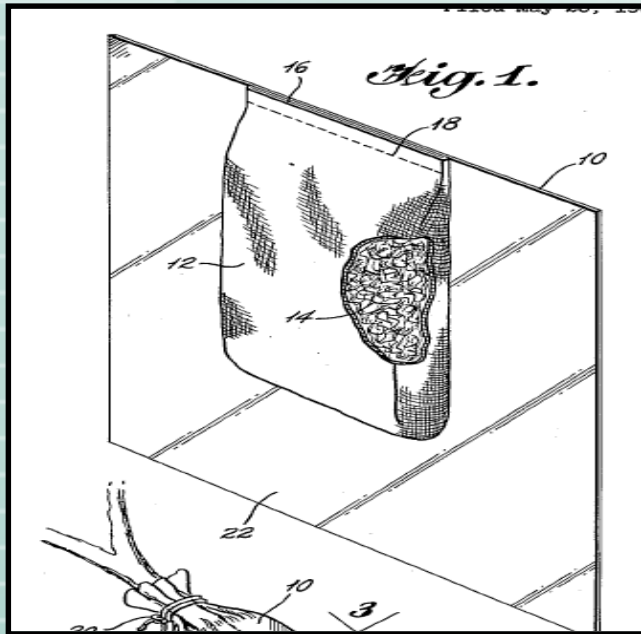


# What is Air-layering

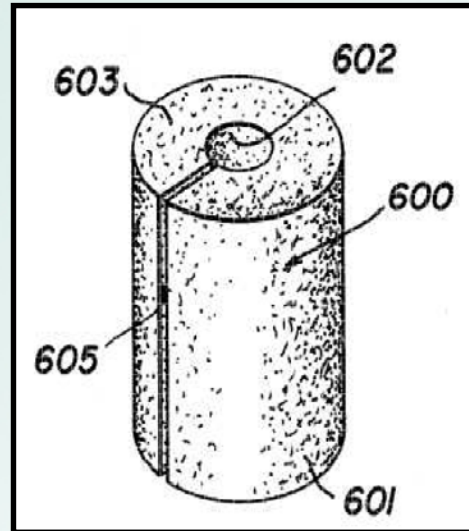


# Review of air layer arts

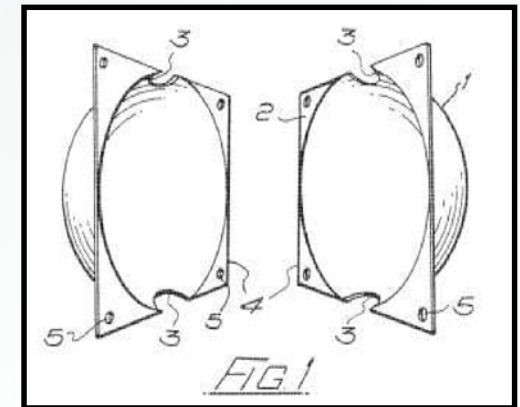
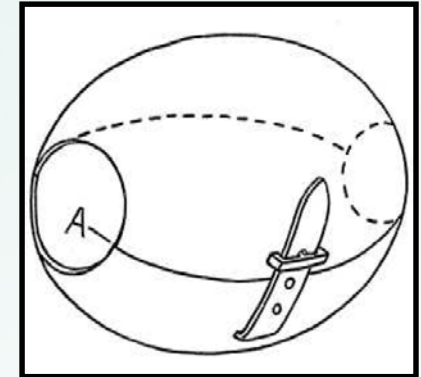
Cotton gauze bag  
attached to clear plastic  
sheet



Slit tube of hydrophilic  
polymer as growth media



Plastic shell w/clasp  
filled with growth  
media



# Standard view of air layering



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



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

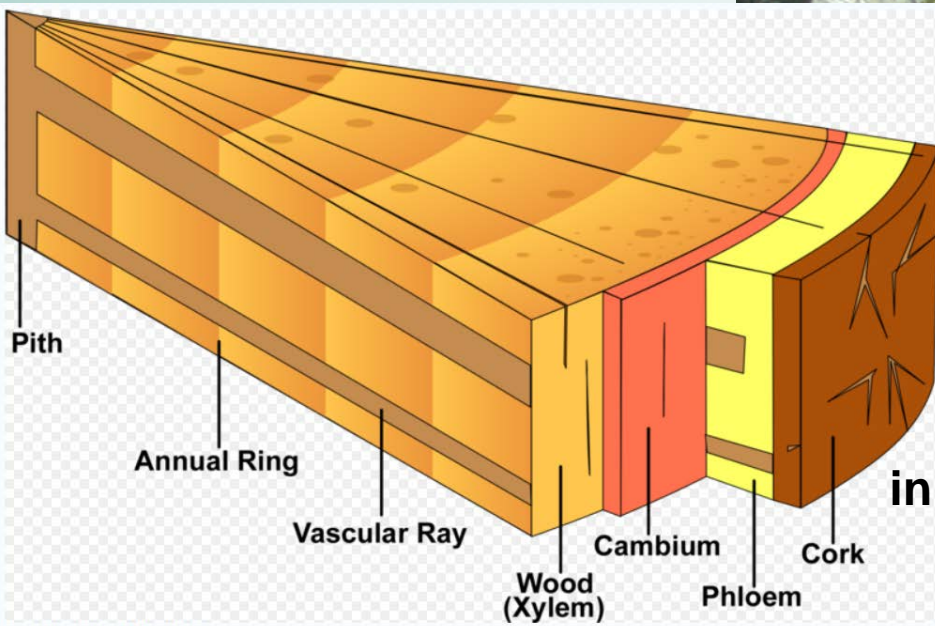


**Fruits and flowers = not optimum growth stage for air layering**



# Woody stem is ready to air layer ?

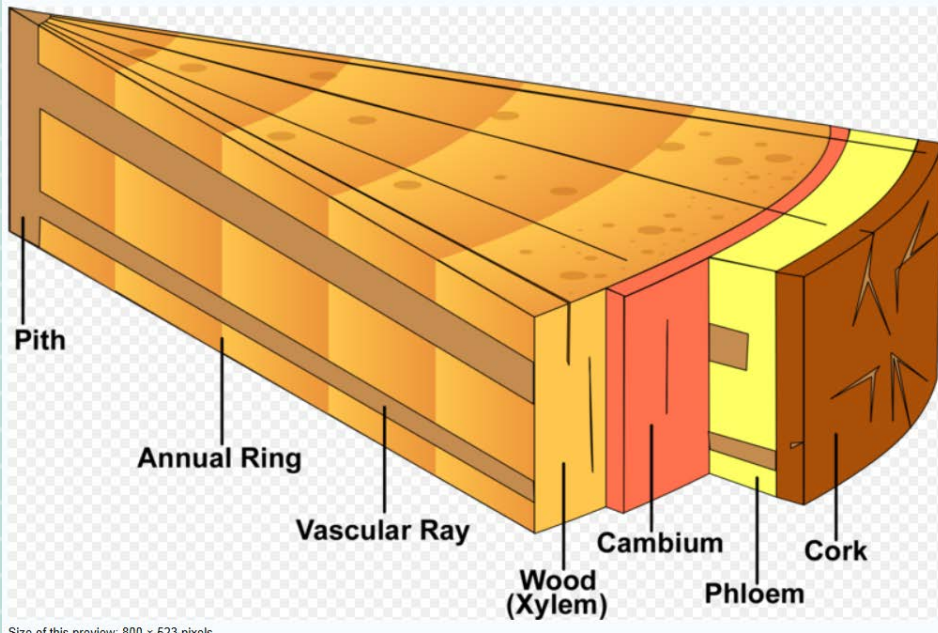
Insure active growth and barks slips easily



Remove cambium layer/ to prevent reconnection of phloem. Block need 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



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



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



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

**Set size for known stem diameter**



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



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



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

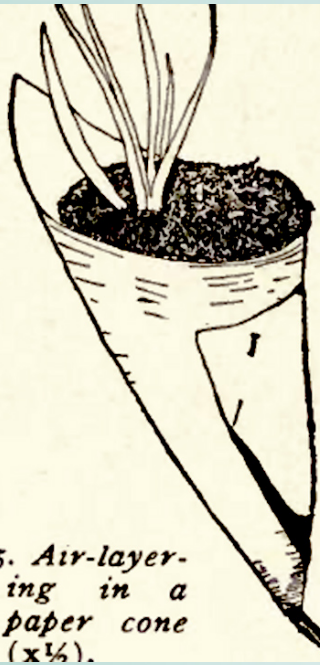


**Net sack held to stem with opened paper clip**



**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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35. Air-layering in a paper cone (x 1/2).



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



**Removed from mango 03/18/11**



**Estb. 07/07/11**

**Estb. 07/07/11**





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





# Air layers for fruit breeding exchanges

- Air layering mature branches allows international plant breeders to exchange germplasm without complicated environmental storage requirements needed for pollen collection and shipment.
- Soilless plants can be easily prepared to meet phytosanitary shipping requirements, e.g: w/hot water & pesticide dips.
- Research needed : postharvest storage and subsequent flowering synchronization using temperature and sunlight manipulations.



**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

Contact

Dr. Joe DeFrank

3190 Maile Way Rm. 102

Honolulu, HI 96822

Email: [defrenk@hawaii.edu](mailto:defrenk@hawaii.edu)

Ph: 808-956-5698

FAX: 808-956-3894



