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 breeding exchanges and native plant preservation
What is Air-layering
Liberty Hyde Bailey – 1858 - 1954
Pot-layering, circumposition, air-layering and Chinese layering are terms applied to the rooting of rigid stems by means of surrounding them, while in their natural position, with earth or moss, or similar material. The stem is wounded—commonly girdled—and a divided pot or box is placed about it and filled with earth (Fig. 34). The roots
What is Air-layering

35. Air-layering in a paper cone (x\frac{1}{2}).

36. Layering-pot, provided with a niche in the side to receive the stem, and a flange behind for securing it to a support. The pot shown in Fig. 33 is a similar device. Fig. 37 represents a layering-cone. It is made of zinc or other metal, usually 4 or 5 inches high, and

38. Layering-cup.

39. Layering-cup.
Review of air layer arts


Cotton gauze bag attached to clear plastic sheet
Review of air layer arts


Slit tube of hydrophilic polymer as growth media
Review of air layer arts

Patent #: GB2057234-03/08/1979

Football-like shell with clasp filled with growth media
Review of air layer arts

Patent #: GB2108813-01/10/1982

Hollow round shell with clasp filled with growth media
Review of air layer arts


Hinged cone with water reservoir below media chamber
Local air layer method with media in bags
Images courtesy Dr. Ken Leonhardt-UH TPSS
Study species – Cassia x nealia Irwin & Barneby
A hybrid of C. Javanica L. x C. Fistulosa L.

Crosses made 1910-20 by David Haughes in Honolulu, selected 1917-20
Study species – Cassia x nealia Irwin & Barneby
Common name = Rainbow shower tree

cv. Wilhelmina Tenny
Official Street Tree of Honolulu - 1965

cv. Queen’s Hospital White

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

Woody stem is ready to air layer?

Insure active growth and barks slips easily.
• Cut through cork (bark) and cambium layers at an angle with a serrated knife.

• Angled cut insures exposure of proper stem layer for hormone induction of root growth.

• Serrated knife provides maximum hormone surface area with grooves from the 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.
Shrink wrap secures media for strong root growth, chop stick inserted into the net sack provides a path for water drainage.
Opening at top side accommodates stem swelling during root formation requires ant control and drainage.
Prolific root growth allows for direct field plantings.
Prolific root growth allows for direct field plantings

LAYERS REMOVED FROM HOST PLANT AND PLANTED ON 02/25/07
PHOTO ON 08/13/11 = 4.5 YEARS OF FIELD GROWTH.
Prolific root growth and flower production allows for Bench-top pollination & breeding exchanges
Air layers for international exchanges

- Air layering mature flowering branches allows international germplasm exchange without need for pollen collection and specialized shipment.
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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