An Improved Method of Air Layering Tropical Hardwoods for Forestry, Fruit and Ornamental Nurseries
Topics Covered

- What is air-layering
- Review of air layer art in patent records
- Study species for improved air layer method
- Details of improve air-layer method
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 (x1/2).

36. Fastening the paper cone to the plant with a string.

37. Layering-cone. It is made of zinc or other metal, usually 4 or 5 inches high, and

38. Layering-cup. The top may be cut off and potted independently, the old stump being discarded.

39. Layering-cup.
Review of air layer art in patent records
Report-Ashmar Tech-08/05/2010


Cotton gauze bag attached to clear plastic sheet
Review of air layer art in patent records
Report-Ashmar Technology-08/05/201


Slit tube of hydrophilic polymer with growth media
Review of air layer art in patent records
Report-Ashmar Technology-08/05/201

Patent #: GB2057234-03/08/1979

Football-like shell with clasp filled with growth media
Review of air layer art in patent records
Report-Ashmar Technology-08/05/201

Patent #: GB2108813-01/10/1982

Hollow round shell with clasp filled with growth media
Review of air layer art in patent records
Report-Ashmar Technology-08/05/2010


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 nealiae Irwin & Barneby

A hybrid of C. javanica L. x C. fistulosa L.


Crosses made 1910-17 by David Haughes in Honolulu, selected 1917-20
Study species – Cassia x nealiae Irwin & Barneby

C. fistulosa L.- male parent

Origin: India
In HI for 160+ yrs.

Heavy pod production
Study species – Cassia x nealiae Irwin & Barneby

C. javanica L. – female parent

Origin: Java & Sumatra, Indonesia
Study species – Cassia x nealiae Irwin & Barneby

cv. Wilhelmina Tenney
Official Street Tree of Honolulu - 1965

cv. Queen’s Hospital White

F. Vrugtman, 1994. HortScience:29(9), 970-971

cv. Lunalilo Yellow
Improvement to existing air layer systems

Girdle > callus formation > hormone + sphagnum moss + plastic film
Improvement to existing air layer systems

Girdle > callus formation > hormone / sphagnum moss + plastic film
Improvement to existing air layer systems

Problems

1. Time consuming to prepare moss on film strips
2. Sealing ends w/string caused failures due to constriction above root formation zone
3. Ants invaded moss and caused rots
4. Opaque film = Uncertainty of root formation
5. Working off the ground, hard to apply film wraps
Improvement to existing air layer systems

Improvements to reduce time and improve % rooting

1. Best time of year in HI: Sept to Nov.
2. Insure active growth and barks slips off easily
3. Latex paint with insecticide for ants
4. Fill net sack with sphagnum moss, for hands free film application
5. Shrink wrap for easy sealing and viewing root formation
6. Wrapping procedure to prevent constriction above root zone
7. Incorporate drainage for work in higher rainfall areas
Insure active growth and barks slips easily
Insure active growth and barks slips easily

Remove cambium to prevent reestablishment of phloem
Insure active growth and barks slips easily
Insure active growth and barks slips easily

0.8% Indol -3- butyric acid (Hormodin 3)
Improvement to existing air layer systems

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Latex paint with insecticide for ants
Permethrin SFR or Tengard
Termiticide/Insecticide

Application: Apply as a pinstream, as a fine/coarse, low pressure spray (20 psi or less) as a spot treatment or with a paintbrush.

Ornamental Plants, foliage and flowering plants, evergreens, woody and herbaceous non-edible ornamentals and non-bearing plants of fruiting species in landscaped.
Improvement to existing air layer systems

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Fill net sack with sphagnum moss allows for hands free film application

Long media sack for branches of various sizes
Improvement to existing air layer systems

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Shrink wrap secures media for strong root growth
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7. Incorporate drainage for work in higher rainfall areas
Opening at top side requires ant control and drainage
Prolific root growth allows for direct field plantings
Removed from mango 03/18/11

Estb. 07/07/11

Estb. 07/07/11
Flowers that emerge during air layer establishment, can be used in tree breeding.
Improvement to existing air layer systems

Improvements to reduce preparation time and improve % rooting

Dr. D’s Wrap

1. Media in long net bags for branches of various sizes
2. Hands free attachment of media allows for easy film application
3. Loose wrap at top side prevents constriction above root zone
4. Insecticides keep out ants other pests
5. Drainage system essential for high rainfall areas
6. Tight fitting wrap helps with strong root development
7. Wrap keeps roots safe for transportation off site and ideal for soilless shipment to address phytosanitary restrictions.
For more information on topics covered

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