

**‘ĀINA MAUNA CHRISTMAS TREE DEMONSTRATION PROJECT PLANTING
DECEMBER 6, 2014
8:00 AM – 3:00 PM**



The ‘Āina Mauna Christmas Tree Demonstration Project involves importing and propagating seed and outplanting [Douglas fir](#), [Noble fir](#), and [Grand fir](#) seedlings on Department of Hawaiian Homes Lands (DHHL) land in Humu‘ula/Pi‘ihonua on Hawai‘i Island. Our goal is to show that these Christmas tree species are suitable for Hawai‘i production and to establish protocols to grow top quality trees that can compete with imported trees in our local markets.

Agenda for the Day

- I. Blessing and Opening Protocols
- II. Presentations: Seed vs. Seedlings-Aileen Yeh
Nursery Protocols-Aileen Yeh
Site Preparation-Mike Robinson
- III. Planting Demonstration-Mike Robinson and Aileen Yeh
- IV. Volunteer planting
- V. Lunch Break
- VI. Volunteer planting
- VII. Pau

Presentations

Aileen Yeh, Hawai‘i Agriculture Research Center (HARC) Horticulturalist and Researcher

Why did we choose to grow our own seedlings?

Buying seed vs seedlings from outside Hawai‘i: *Phytophthora ramorum* causes “sudden oak death” in parts of California, Washington, and Oregon. Douglas fir, Grand Fir, White Fir, and Red Fir have been found to be infected with *P. ramorum*. *P. ramorum* is spread by water and soil movement; therefore we imported seed instead of seedlings. Symptoms include tip and shoot die-back and damage looks very much like injury from frost or Botrytis tip blight. Our main concern is that our native Acacia koa, ‘Ōhelo, and Pūkiawe have been shown to be susceptible to *P. ramorum*. Other species that have not been tested may also be susceptible.



Selection of seed sources is important: Because plants growing in different areas are adapted to their area, they may not do well when planted in areas that are drier or wetter, or hotter or colder than where they originated. Also, many conifers and temperate plants require specific day lengths.

Nursery Protocols

- 1. Seed Quality:
 - Purity (at least 95% pure seed) and soundness
- 2. Stratification and germination tests
- 3. Sowing calculations
- 4. Container type, growing medium and tray filling
- 5. Growing Regimes:
 - Germination Phase
 - Initial Growth Phase
 - Accelerated Growth Phase
 - Bud Initiation and root collar diameter Growth

Desired Seedling characteristics: Large root collar diameters, well-formed buds, high root growth potential.

Potential Problems in the Nursery:

1. Rats and birds when germinating
2. Slugs and other nursery pests
3. Too wet or too dry
4. Fusarium and other root rots

Mike Robinson, Department of Hawaiian Home Lands (DHHL) Forester

Species Selection, Site Evaluation, and Site Preparation

Why we selected these species?:

- Real Christmas trees – look, smell, durability
- Popular in Hawai‘i, market already exists
- Have tested Douglas fir in this area with positive results
- Rated as non-invasive

Site Evaluation: Good Christmas tree sites have the following characteristics (site specific information underlined):

- Open to full sun – yes
- Adequate rain – more than 25 inches per year – 60 - 78 inches per year
- Well drained soils – PUC - Pu Oo silt loam, “strongly acid”, rapid permeability, slow runoff, slight erosion hazard
- Level or moderate sloping - PUC – “6-12% slopes”
- Good soil pH – between 5.1 and 6.5; current pH is 4.7
- Adequate soil nutrition – both macro and micro-nutrients; 11-52-0, need P, CA, Mg
- Room for rooting – PUC – root penetration to 3 feet or more
- Good site preparation – clear of stumps, competing brush, deep ripping, disking or plowing, and leveling. Ripped, grass treated twice with Habitat/Roundup herbicide
- Adequate roads – All weather roads “key ingredient”. Rough road, need good weather
- Suitable location – U-Cut trees need to be close to population centers, if farm is remote can be difficult to prevent vandalism. Wildlife damage can be a problem at any site. Area very remote, sheep/cattle/pig fenced.

Mahalo to Project Funders & Partners

Department of Hawaiian Home Lands, State of Hawai‘i Department of Agriculture, County of Hawai‘i Department of Research & Development, Hawai‘i Agriculture Research Center, DLNR Division of Forestry & Wildlife, Coordinating Group on Alien Pest Species, Hawaii Invasive Species Council, Preserve Hawai‘i, and USDA Forest Service

Learn more at <http://www.hawaiiforestinstitute.org/our-projects/christmas-tree-demonstration-project/>

Hawai‘i Forest Industry Association

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MAHALO ‘ĀINA

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