

# Pacific Madrone Provenance Trial

2014 Assessment of the Starker Forest site  
(Trial assessed Oct 15 & 20th, 2014)

**Draft Report** 10/27/2014

(Photos: R.Sniezko)



# Objective

- **Provide the first baseline data on range-wide genetic variation in adaptive traits (e.g. growth) and resistance to pathogens for this wide-ranging species.**
  - 105 families collected from 7 ecoregions were planted in five locations in California (1), Oregon (2), and Washington in fall 2011/winter 2012; and a slightly different subset in BrCol (2) in 2014 (see some details at [http://puyallup.wsu.edu/ppo/madrone/research/common\\_garden/index.html](http://puyallup.wsu.edu/ppo/madrone/research/common_garden/index.html) )



# Oregon Pacific Madrone: Sources for Seed

- 105 families represented
- 7 Ecoregions represented

[http://puyallup.wsu.edu/ppo/madrone/research/common\\_garden/](http://puyallup.wsu.edu/ppo/madrone/research/common_garden/)

Map: from Marianne Elliott?)



# Assessments

- OR trials assessed in fall 2012, 2013, and 2014
- CA trial with extreme mortality (drought) in 2012 (no further assessments to date?)
- WA trials assessed in 2012 and 2013?
- 2 British Columbia trials recently established – one has high drought related mortality

# 2014 Assessment (Oregon sites)

- **Assessment Team 2014:** Bob Danchok, Brian Luis, Sally Long, Richard Sniezko (all 3 days); Juli Sticha, Rachel Zitomer, Lisa Foster (Oct 15 & 16); Angelia Kegley (Oct 20) – all USFS Dorena GRC.
- Samples of dead trees (mainly roots) collected from both sites to send to Gary Chastagner (to test for *Phytophthora*) – 11 samples from SF site, 13 samples from BLM Sprague site.
- See 2013 & 2012 Sniezko powerpoint reports for comments & photos from previous assessments

**2014 Oregon Pacific Madrone**  
**Site Assessments (OR sites, Oct 2014)**

**Plant Condition**

- 1 = alive
- 2 = dieback\*\*
- 3 = wilting
- 4 = dead
- 5 = missing

**Total ht (cm):** total height of seedling

**# leaders:** 1 is default, 2=forked, 3= >2  
leaders

**Leader branching:** 0 = no (default)  
— 1 = branching

**new growth\*:** Active new growth on  
terminals  
0 = none (default)  
1 = buds swollen to a large degree  
2 = flushing buds

**blight sev:** severity of symptoms on most  
severely impacted current season leaf  
0 = none  
1 = slight (<25% of leaf area affected)  
2 = moderate (25 to 50% of leaf area affected)  
3 = severe (>50% of leaf area affected)

**blight inc:** whole tree  
1 = <25 of leaves with severity rating  
2 = 25-50% of leaves  
3 = 51-75% of leaves  
4 = >75% of leaves

Blight total: %of total leaf area affected

**Comments**

- 1 = leaf rust present
- 2 = chewing insect damage present
- 3 = variegated foliage present
- 4 = browse damage evident
- 5 = Burrowing varmint activity around tree
- 6 = Reddish-green fully expanded foliage
- 7=basal sprouts
- 8=2<sup>nd</sup> flushing

\*very little in 2014,  
but 2<sup>nd</sup> flushing was common at Starker  
site  
\*\*2.1, 2.2, and 2.3 used to denote  
increasing levels of dieback from minor  
to whole main stem

# Assessment team

- Bob Danchok, Brian Luis, Sally Long, Richard Snieszko (all 3 days); Juli Sticha, Rachel Zitomer, Lisa Foster (Oct 15 & 16); Angelia Kegley (Oct 20).
- Samples of dead trees (mainly roots) collected from both sites to send to Gary Chastagner (to test for Phytophthora) – 11 samples from SF site, 13 samples from BLM Sprague site.
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# Starker Forest site



- Some scattered mortality
- Good growth – several >1.8cm
- Very little insect damage (less than Sprague site)
- A #dead trees easy to pull out of ground – little root system (animal damage?)
- Evidence of animal burrowing
- Some variegated trees, especially in first 3 rows near road/fence – 3<sup>rd</sup> year in a row
- ‘2<sup>nd</sup> flushing’ somewhat common (and recorded using ‘8’ code)
- Some native madrone in area
- Trial assessed 10/15 and 10/20/2014
- **Weather stations on site (Hobos?)**



Looking into trial on Starker Forest land (trial is in fenced area) (4004.jpg)







4008-4011.jpg



Leaf spotting/blight





New 2014 growth above red stem  
(4014.jpg)

Border row along fence & road







Top dieback, basal sprouting



PF5

2







A few trees have 'non-vertical growth form'



Dead seedling









Vareigated seedling

















Dead trees at this site pulled up easy  
– generally few roots (animal damage?)  
(4058, 4058.jpg)









Note mounds of soil indicating animal burrowing activity – common on both Starker Forest and BLM Sprague trial sites (4066.jpg)



dieback



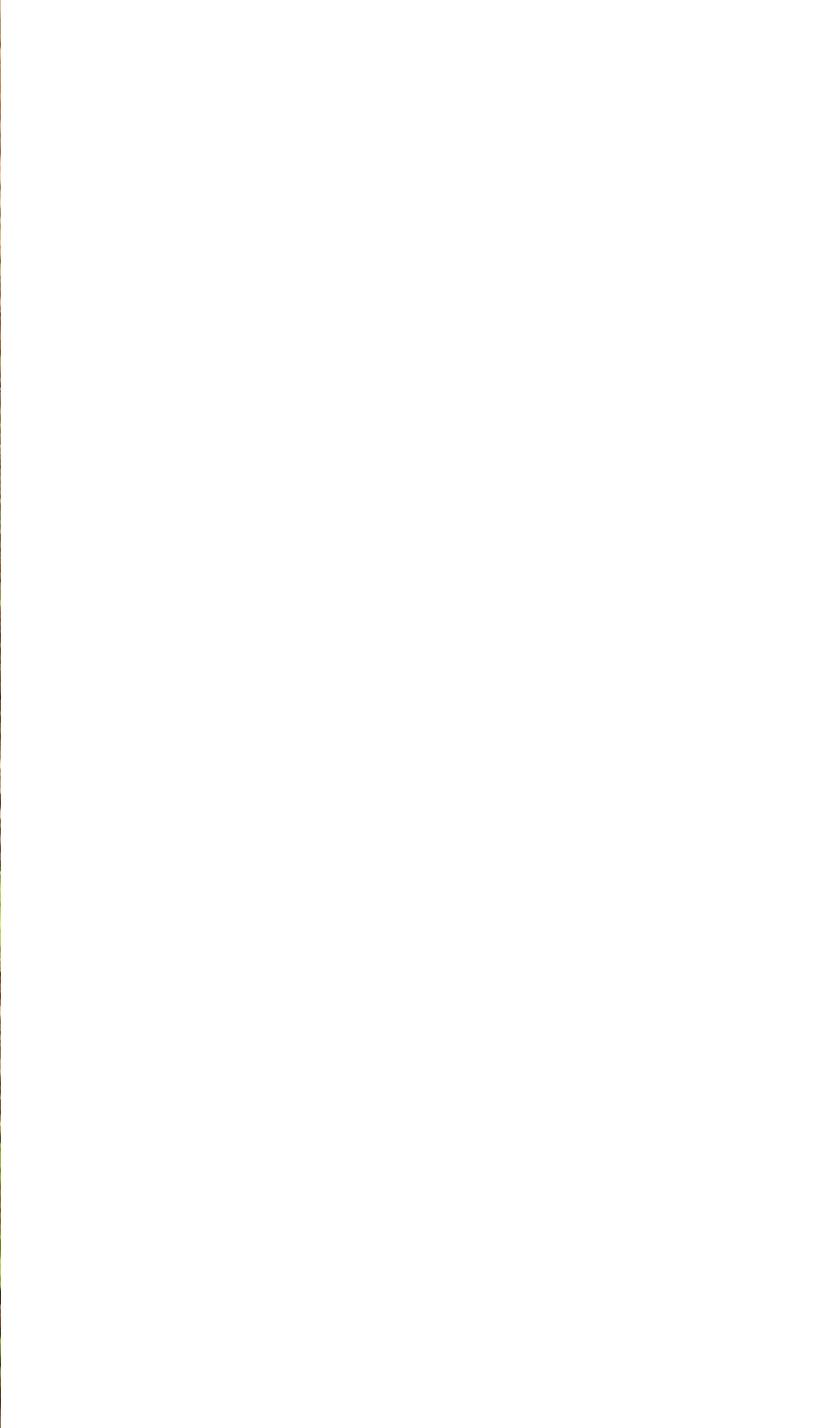
Curled leaves on this tree





Left spotting







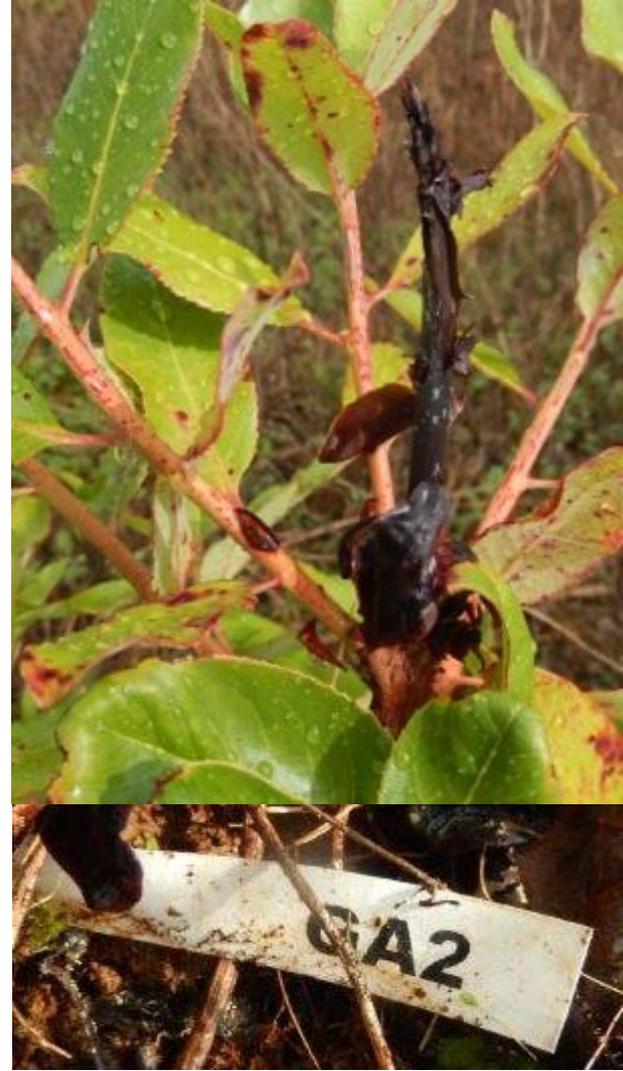


2<sup>nd</sup> flushing



Leaf spotting





Tip dieback

Dieback of lower foliage (4218.jpg)





KL14





Dead seeding





Dieback (4231, 4232.jpg)







Dieback (4236.jpg)





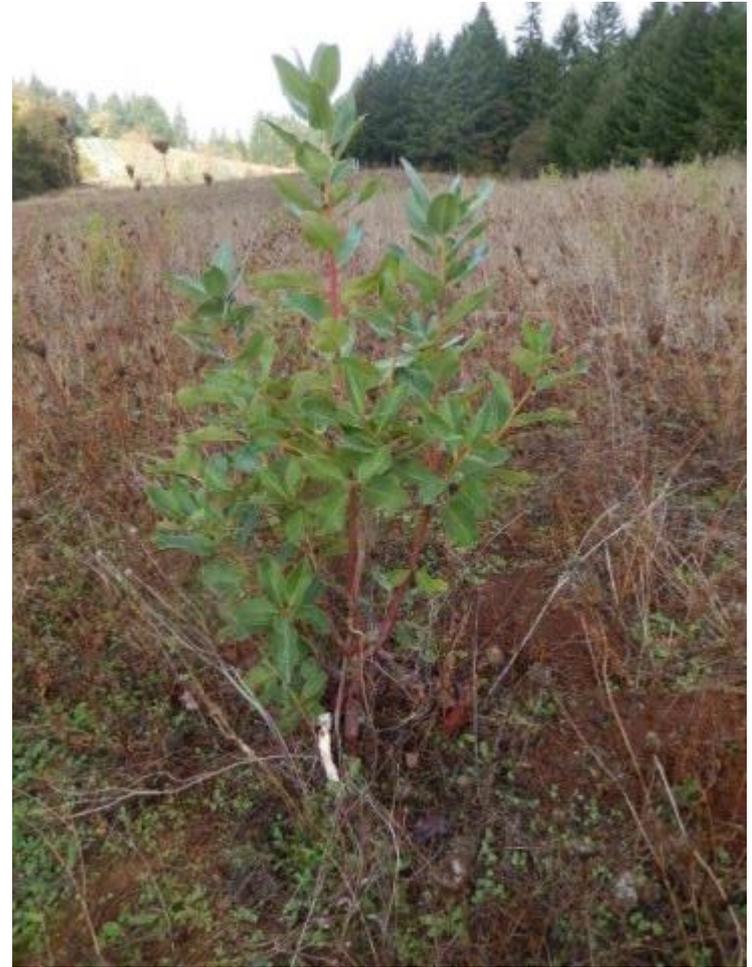
Dead seedling



A photograph of a plant with a white label that reads "BA2". The plant has several large, dark green, serrated leaves. The label is positioned on the left side of the frame, partially overlapping the plant's foliage. The background consists of dry, brownish ground and other vegetation.

BA2











Madrones with evidence of animal burrowing nearby (4254 & 4263.jpg)







Dead madrone



Dieback

2 dead madrones among living ones





DSCN4197.jpg

















natural regen madrone along road outside of  
planting



# To Do

- Data validation
- Compile unified dataset over assessment dates and sites
- Update Row-Col (X-Y) 'maps' showing mortality (different color per year)
- Basic summary info (e.g. mean height by family & source)

# Recommendations

- The leaf blight was generally low at both Oregon sites, and there was little or no rust (most/all 2013 leaves were fallen) – a Spring assessment would likely be needed to pick up more in genetic variation trends for these two traits.

- Cooperators: BLM (Sprague) and Starker Forests provide sites for the two Oregon trials
- Thanks to the many people contributing seedlots to the project
- Pacific madrone Provenance Trial Team Contacts:
  - WSU (Gary Chastagner/Marianne Elliott);
  - USFS, **NFS**: (Jim Hamlin, Richard Sniezko), **PNWRS**:  
Connie Harrington
  - ODF (Alan Kanaskie)
  - British Columbia Ministry of Forests (John Russell)

# Pacific madrone publications

- [A First Look at Genetic Variation in Resistance to the Root Pathogen \*Phytophthora cinnamomi\* using a Range-wide Collection of Pacific Madrone \(\*Arbutus menziesii\*\)](#)  
*Marianne Elliott, Gary Chastagner, Annie DeBauw, Gil Dermott, and Richard A. Sniezko*
- [Range-wide Genetic Variability in Pacific Madrone \(\*Arbutus menziesii\*\): Examining Disease Resistance, Growth, and Survival in a Common Garden Study](#)  
*Marianne Elliott, Gary A. Chastagner, Gil Dermott, Alan Kanaskie, Richard A. Sniezko, and Jim Hamlin*