2023 Annual Meeting
Swiss Needle Cast Cooperative

2023 SNCC Activities

- SNCC Winter Business Meeting & 2022 Annual Report (February)
- Cascade Foothills Transect Network Installation (spring / summer)
- SNCC Field Trip, Roseburg Timberlands & Sudden Oak Death (May)
- Spore Trapping / Hosting Visiting Scholar, Miloň Dvořák (June)
- Mensuration Survey of the SNCC Research and Monitory Plot Network (September – October)

Cascade Foothills Transect Network

Objectives:

- Replace the original network of transects
- Assess and monitor SNC in the foothills of the Cascades
- Survey all transects annually for 5 years

Methods:

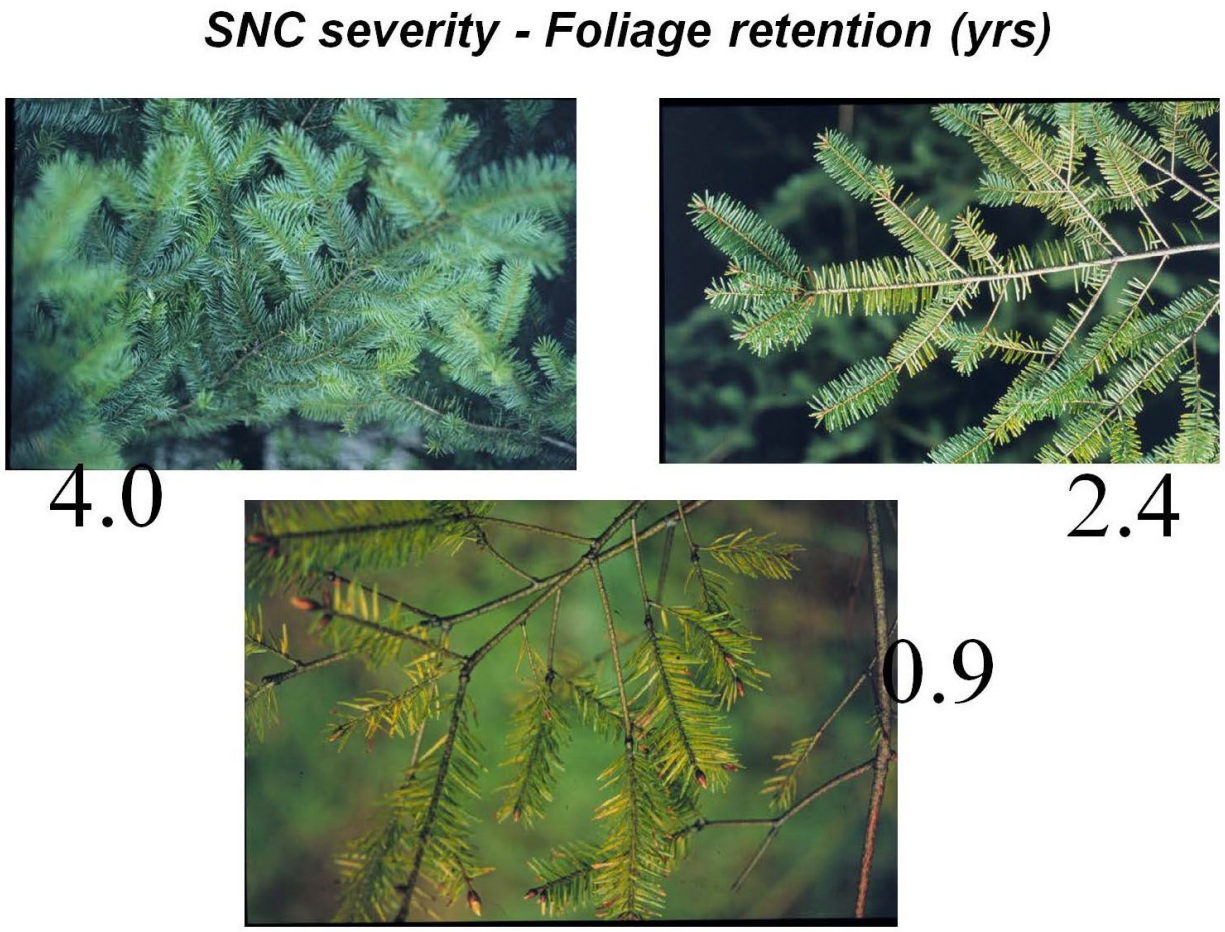
- Douglas-fir dominated stands
- Stands 9-15 years old (at installation)
- 100 meter transects (one per stand)
- Two trees sampled every 20 meters
- 10 trees sampled per stand

Cascade Foothills Transect Network

Cascade Foothills Transect Network

Sampling Methods:

- Diameter at breast height
- Foliage retention
  - Estimation from live cut branch
  - Four cohorts of retention assessed
  - Proportional cohort ratings are summed for total retention (0-4)

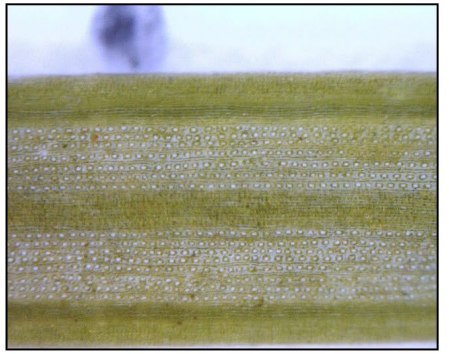


Cascade Foothills Transect Network

Sampling Methods:

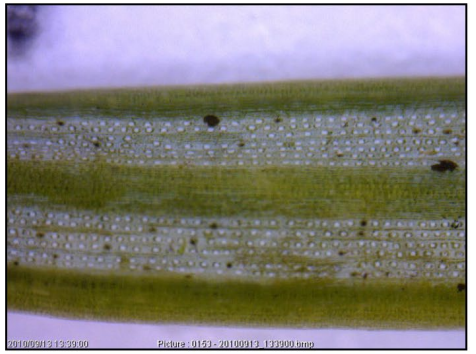
- Disease severity
  - Estimation from live cut branch
  - Pseudothecia density rated as an index (0-3) of proportion of stomatal occlusion
  - Measurements are made on 2-year-old needles only

Pseudothecial Occlusion Rating Index:



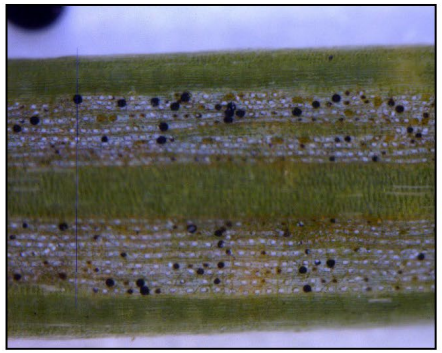
NO PSEUDOTHECIA = 0

(0% occlusion)



LIGHT PSEUDOTHECIA =

1 (occlusion < 30%)



MODERATE = 2

(occlusion 30-60%)

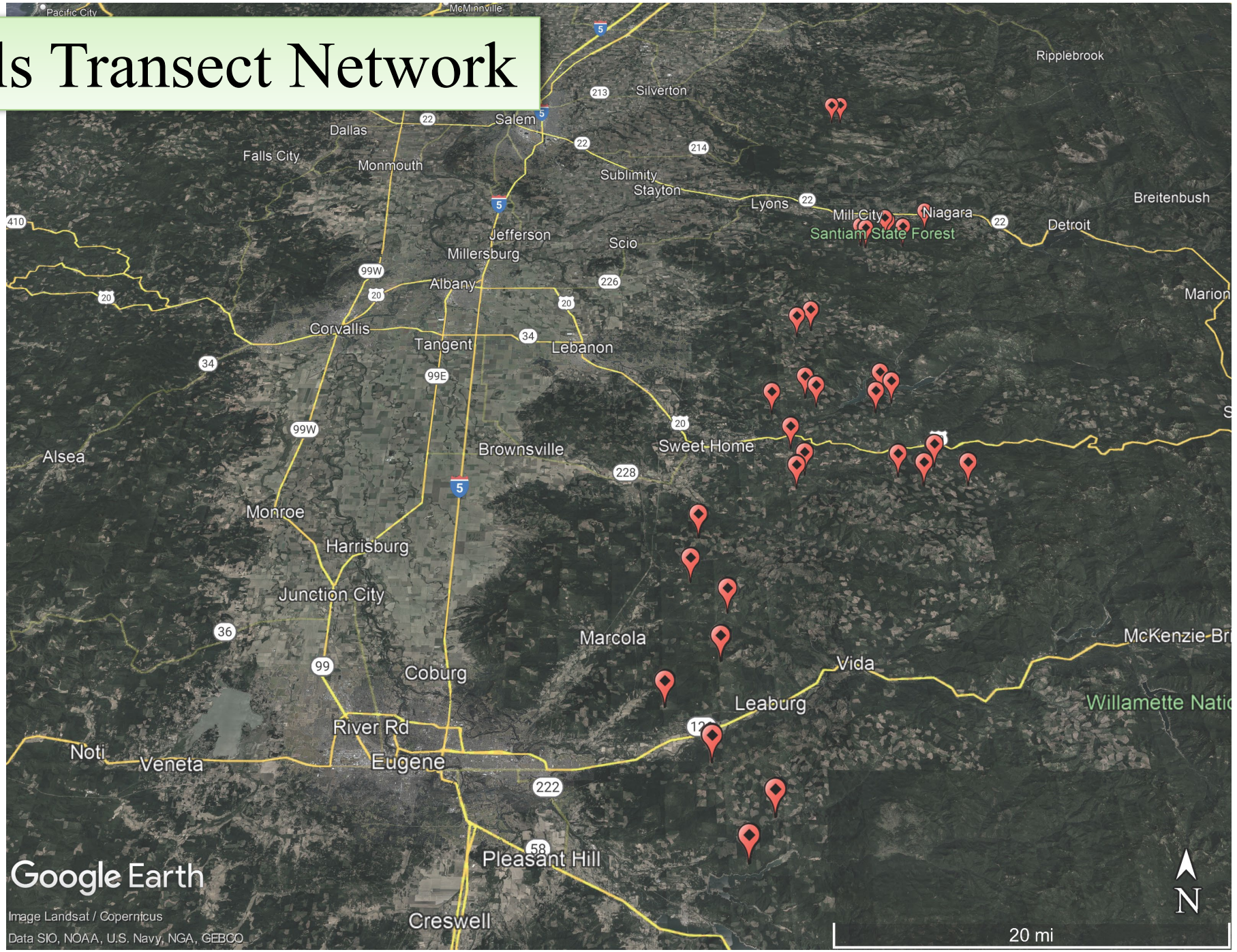
HEAVY = 3

(occlusion > 60%)

Cascade Foothills Transect Network

Newly Installed Transects:

- 31 new transects installed in total (310 trees)
- Wide geographic distribution
- Average foliage retention = 2.7
- Average stomatal occlusion = 2
- (moderate)



2023 Spore Trapping

Objectives:

- Expand on the proof of concept work conducted by the SNCC in 2021
- Provide data on seasonal spore occurrence and weather patterns
- Evaluate the ability of quantitative PCR (qPCR) & spore traps to detect and quantify spores

2023 Spore Trapping

Methods:

- Visiting scholar, Miloň Dvořák
  - Assess in-house rotating arm impaction spore traps
  - Assist with refining spore-trap design and spore trapping methodologies
- Deploy spore traps in areas confirmed positive for SNC infection
- Confirm detection and quantification of captured spores using qPCR

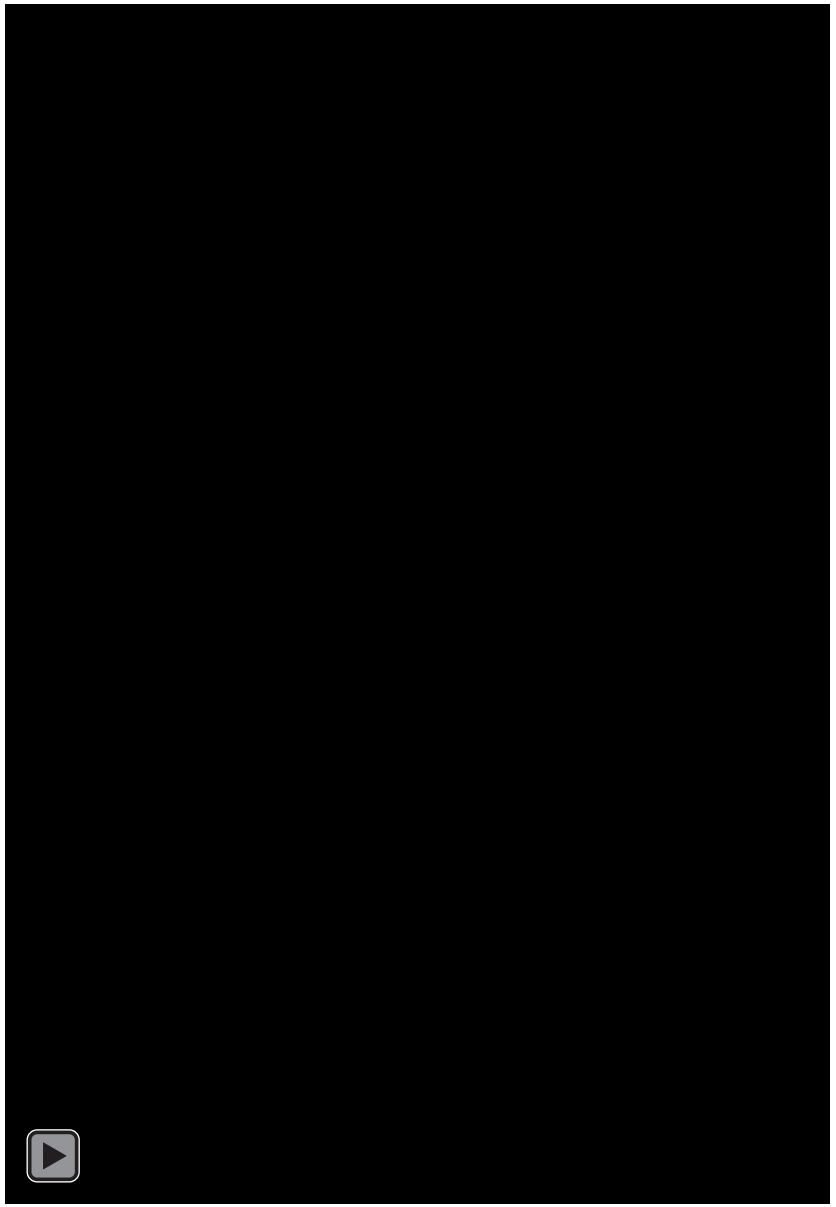
2023 Spore Trapping

Design Adjustments:

- Rotating arms replaced with brass fixtures
- Surface area of rotating arms reduced
- Rotational speed increased (power increased)

Spore Trap Deployment:

- Three modified spore traps deployed near SNCC research and monitoring plot
- Continuous collection for 24 hours



2023 Spore Trapping

Collections awaiting processing

What’s the hold up?

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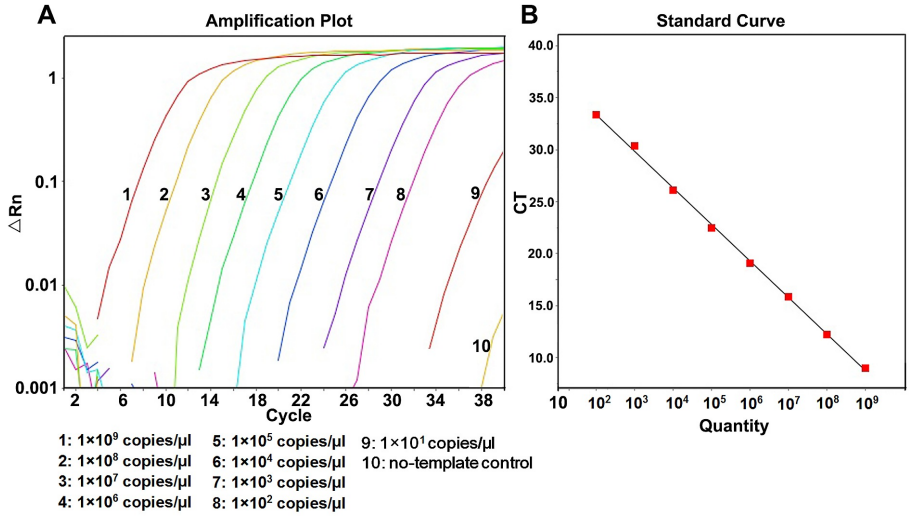
- Insufficient number of spores from infected foliage for qPCR set up



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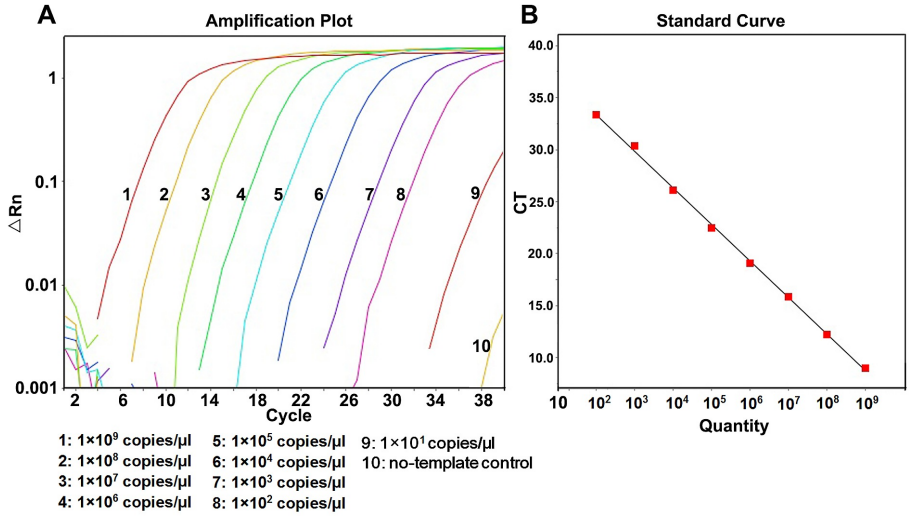

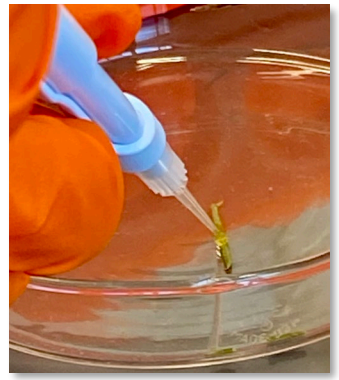

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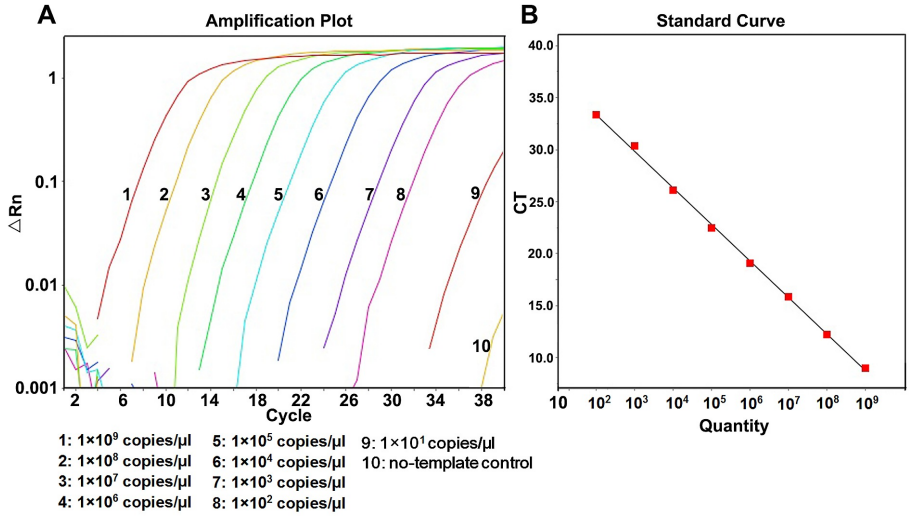
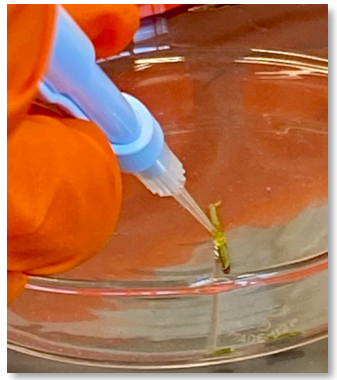
What's the hold up?

- Insufficient number of spores from infected foliage for qPCR set up
- Low yields from mycelial DNA extractions





2023 Spore Trapping

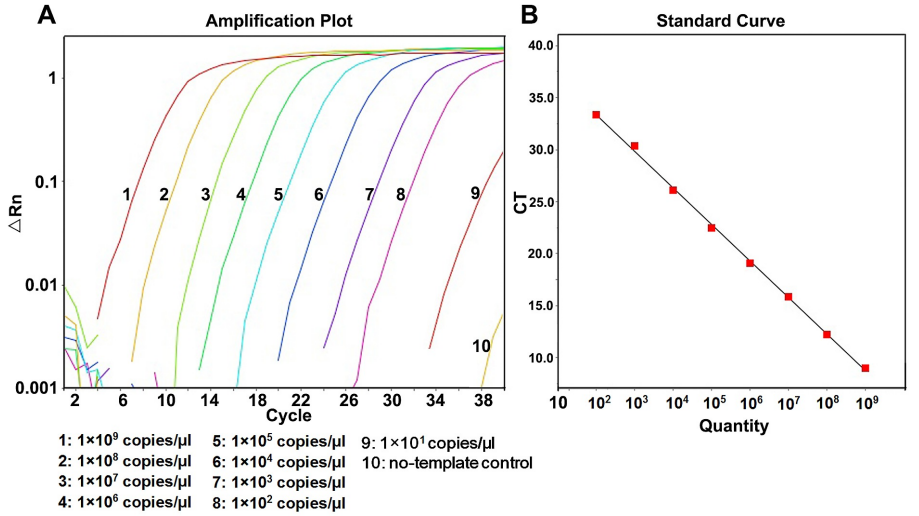
Collections awaiting processing

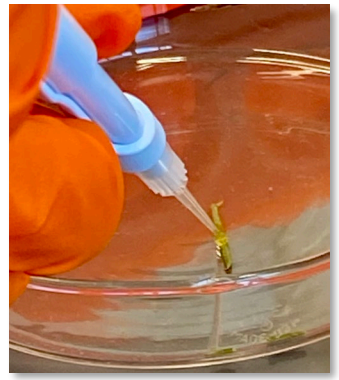
What's the hold up?

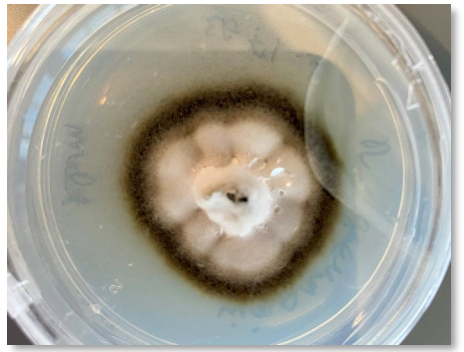
- Insufficient number of spores from infected foliage for qPCR set up
- Low yields from mycelial DNA extractions

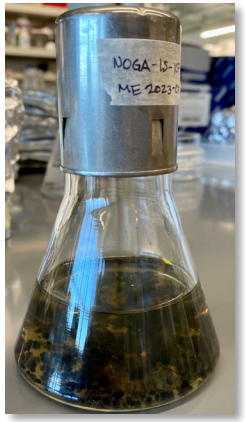
Next Steps:

- Reattempt mycelial DNA extractions
- Reattempt foliage spore collection in the spring
- Must validate laboratory techniques before processing the samples









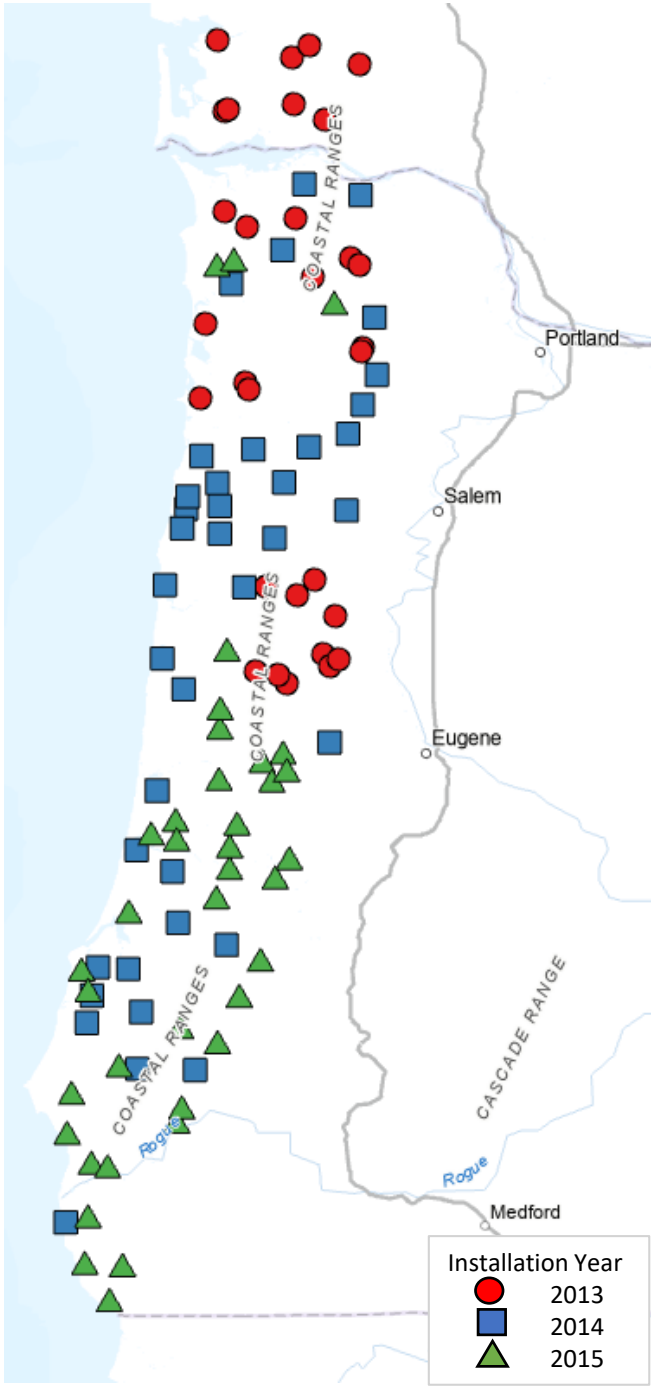
Research & Monitoring Plot Network

Background:

- 106 research & monitoring plots (0.08 ha)
- Established between 2013-2015
- Distributed between CA border and southwest WA, and within 35 miles from the coast

Objectives:

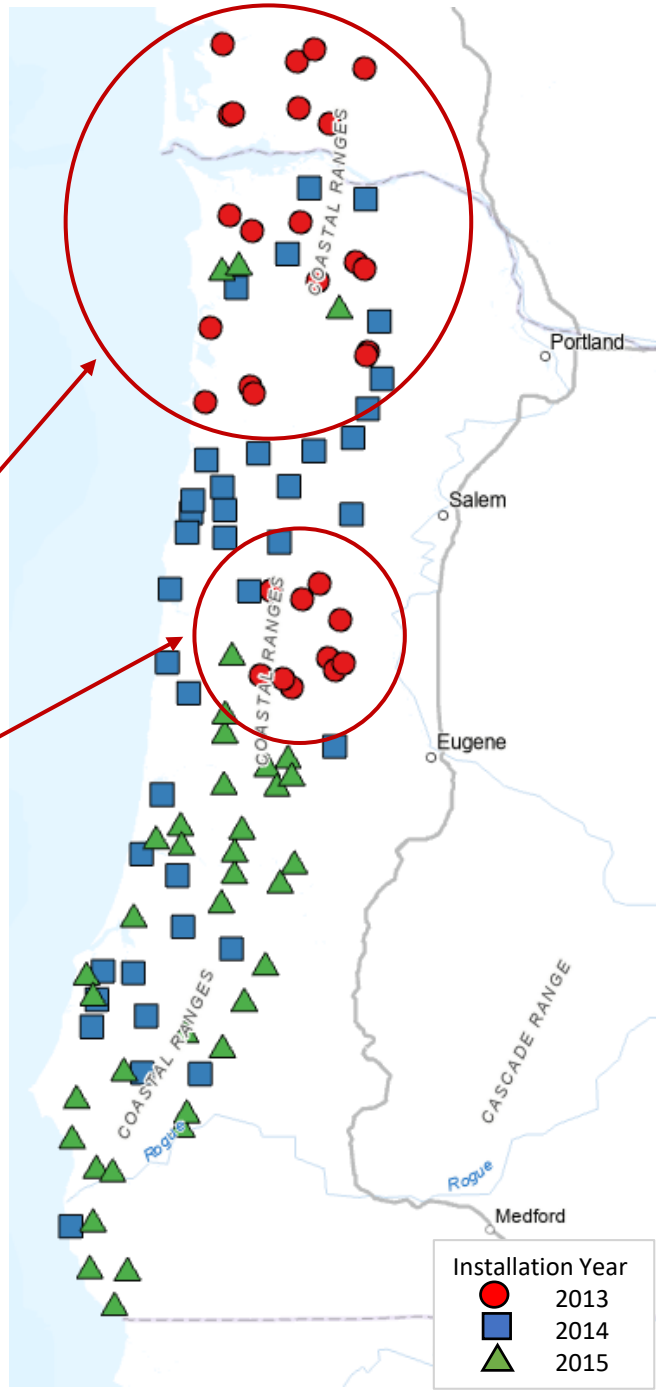
- Assess the relationship between foliage retention and disease severity
  - Relationship variations based on elevation, coastal proximity, location within the crown
- Assess the impact of SNC infections levels on volume growth of Douglas-fir



Research & Monitoring Plot Network

Data Collection:

- Measurement of all plots takes 3 years to complete
- All plots initially measured at the time of establishment, 2013-2015
- Plots remeasured 5 years after installation in the fall 2018- spring 2021
- Third remeasurement began in fall 2023 and will conclude in spring 2026, representing 10 years of growth



Research & Monitoring Plot Network

Data Collection Methods:

- Mensuration measurements collected in the fall
  - Diameter at breast height
  - 40 trees measured for total height and height to crown base

- Foliage sampling collected in spring prior to budbreak
  - Collected from southside of the mid-crown
  - Foliage retention assessed in the field
  - Pseudothecial occlusion counts at OSU

- 2023 mensuration results presented by Doug Mainwaring

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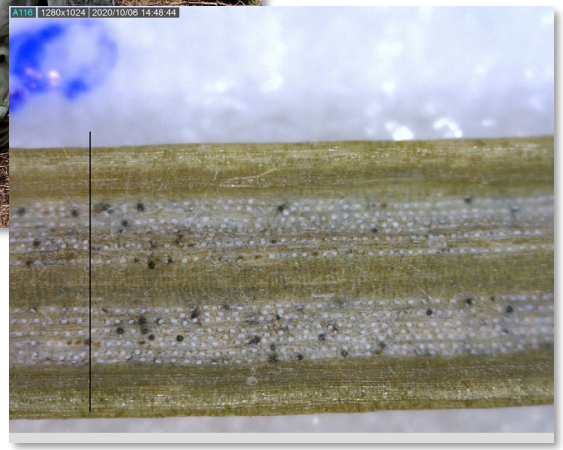


To all of our members and collaborators, Thank you!