

***PHYTOPHTHORA CINNAMOMI***  
**COLONIZED RECLAIMED**  
**SURFACE MINED SITES IN**  
**EASTERN KENTUCKY**

Implications for the restoration of  
susceptible species



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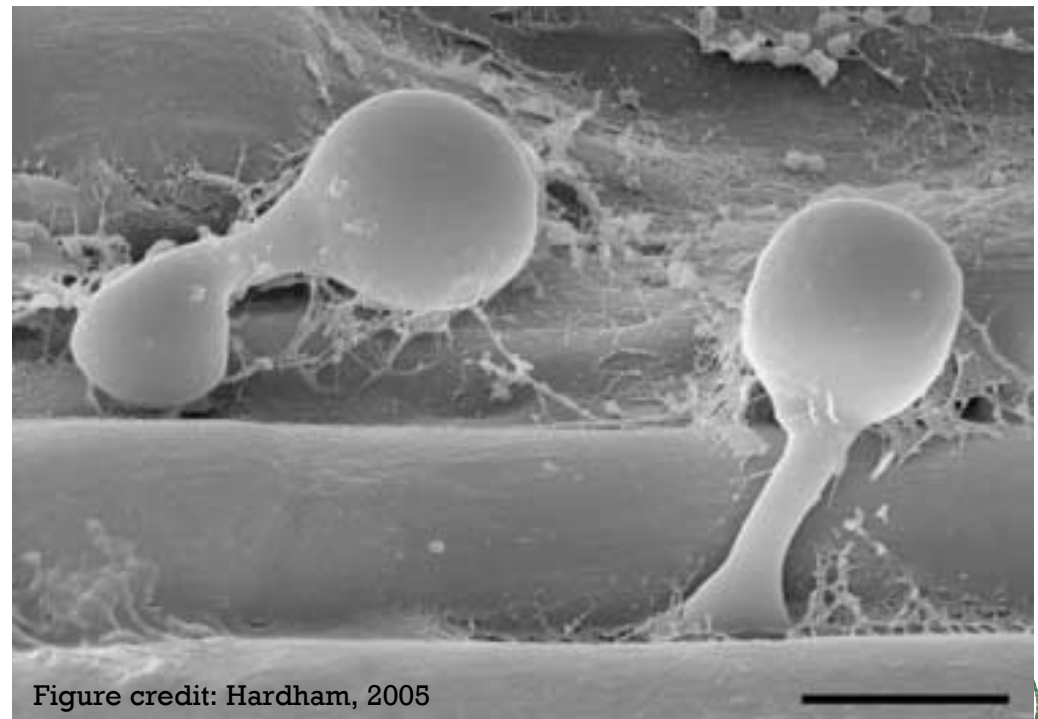
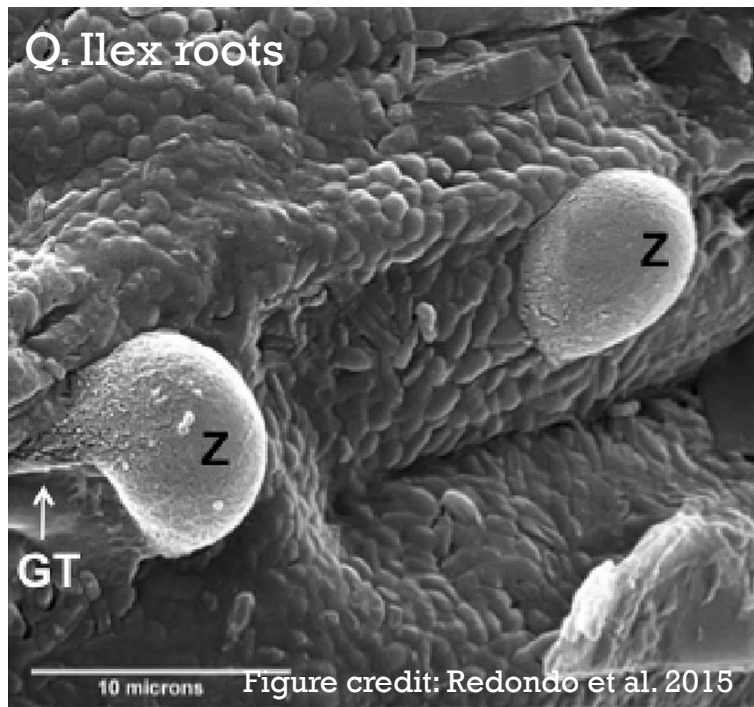
# *PHYTOPHTHORA CINNAMOMI*

- Soilborne oomycete pathogen of thousands of plant species (Shearer et al. 2004)



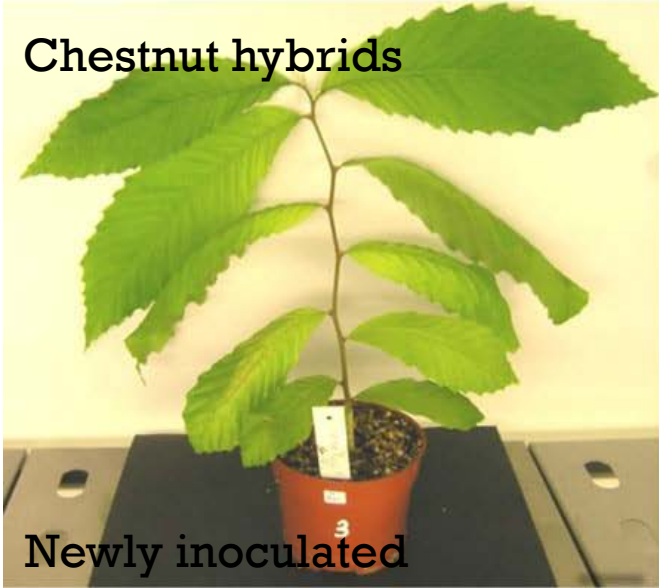
# MECHANISMS AND SYMPTOMS OF DISEASE

- Zoospore encysts on root of susceptible host
- Germ tube penetrates into host root tissue





**Chestnut hybrids**



**Newly inoculated**



**Dead by PRR**



**Uninoculated roots**



**Infected roots**



**Infected shoot**



**Infected fine root**

Figure credit: Santos et al. 2015





# AMERICAN CHESTNUT: A ONE-TWO PUNCH



Photo Courtesy of Forest History Society: URL <http://phenomena.nationalgeographic.com/2013/03/11/resurrecting-a-forest/>

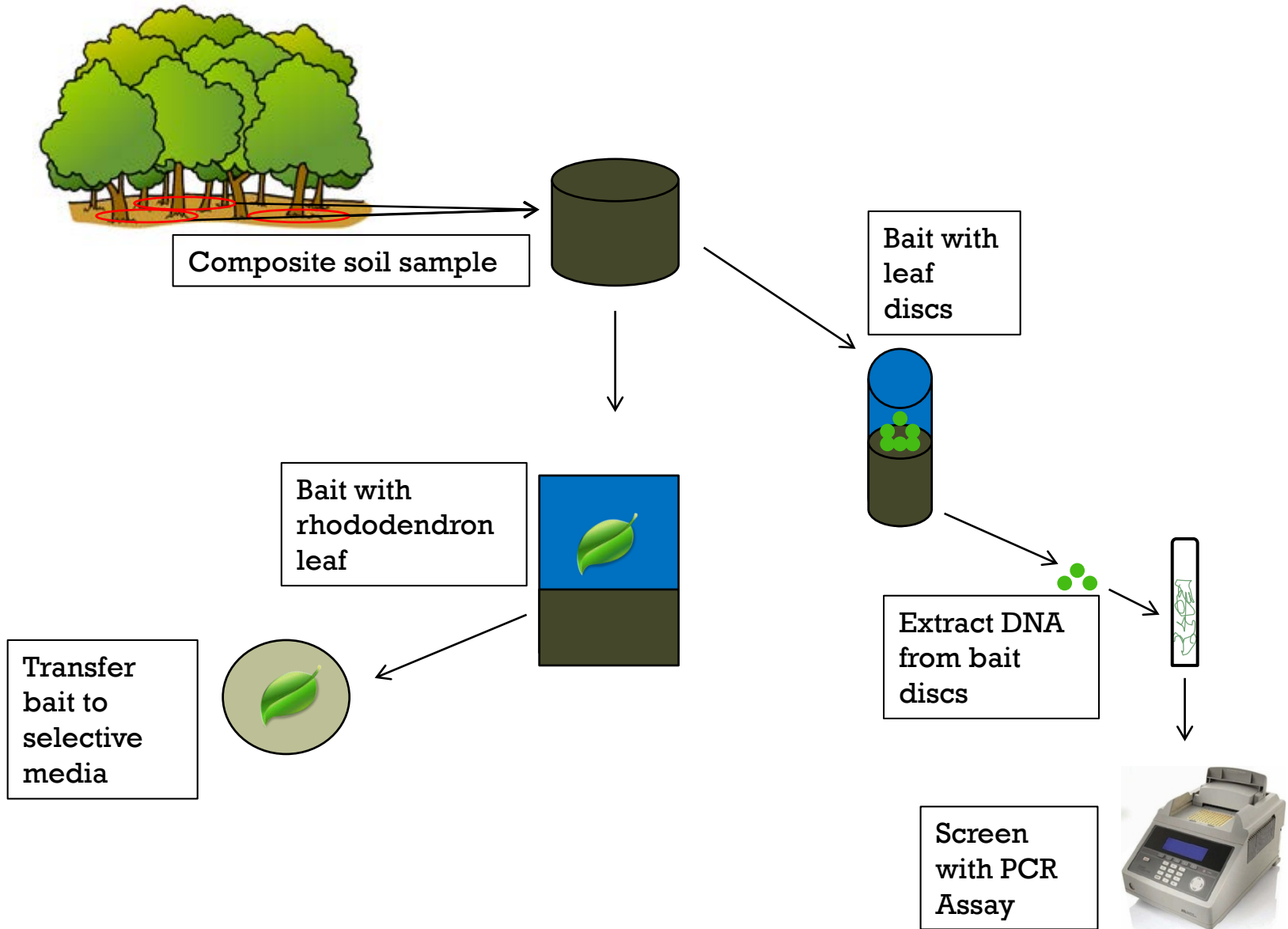


**DETECTING**

***P. CINNAMOMI***

Streamlining screening for large sample numbers





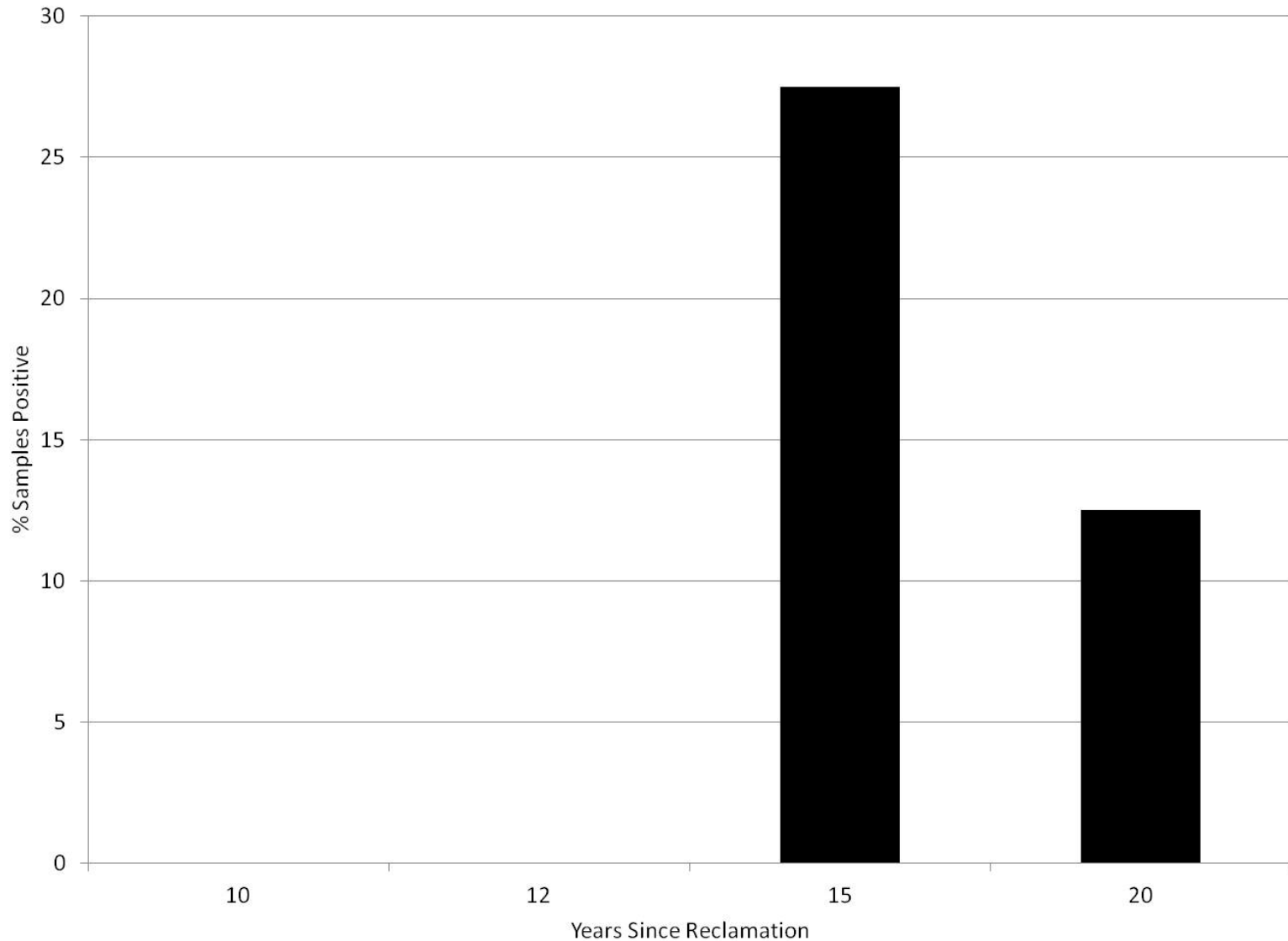
# DISTRIBUTION ON MINES

Patterns of distribution and soil  
development in reclaimed mined sites  
across a range of time since reclamation





# P. CINNAMOMI ON MINED LAND

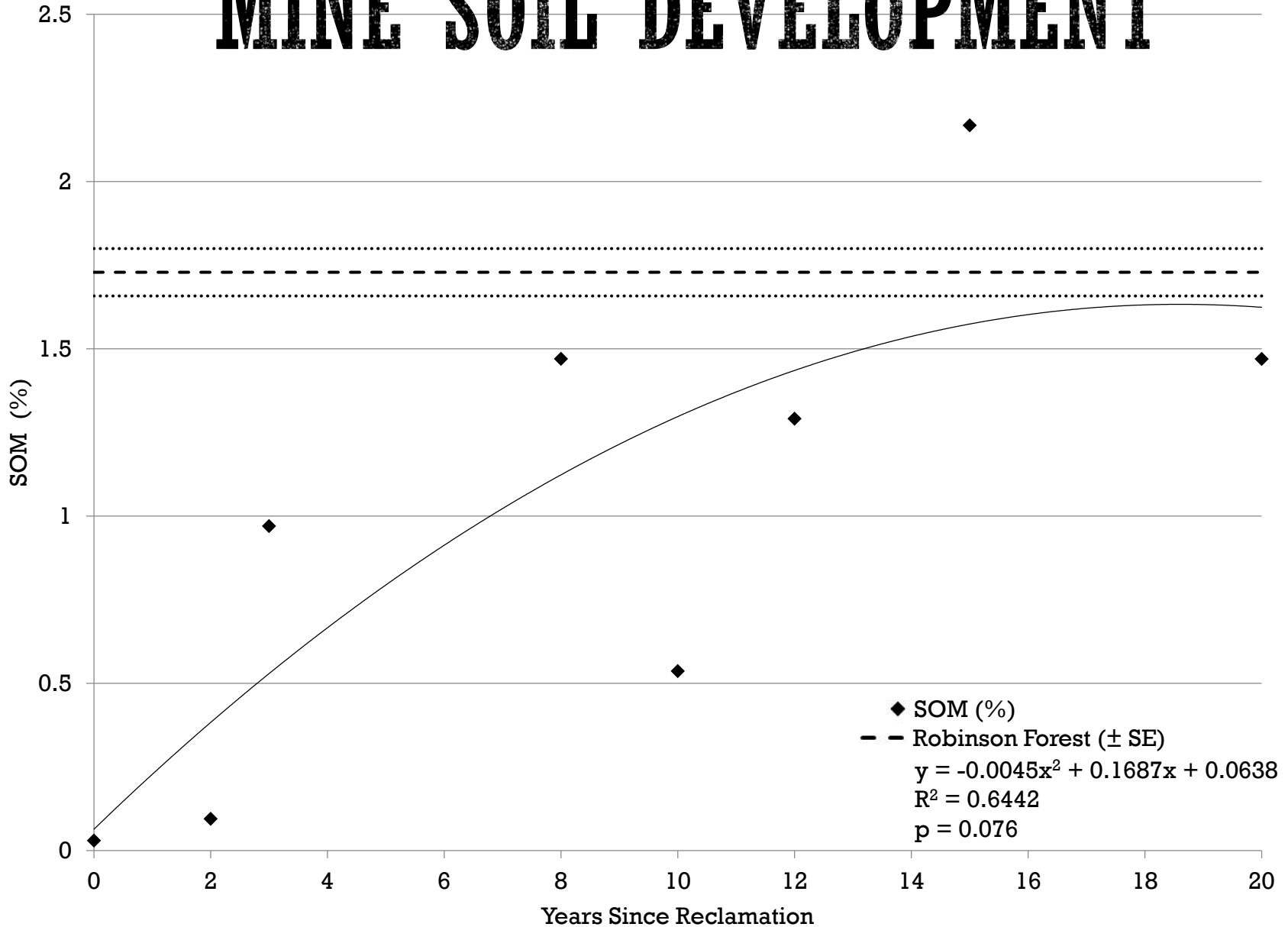


# MINE SOIL DEVELOPMENT





# MINE SOIL DEVELOPMENT



# MINE SOIL DEVELOPMENT

BROWN 1



BROWN 3





# NEXT STEPS

- Characterize **environmental conditions** favorable for **development of disease** in American chestnut and white oak in reclaimed mine sites
- Evaluate potential **mechanisms of entry** into reclaimed mined sites (e.g., nursery stock)
- Understand overall **microbial community development** over time in reclaimed mine sites



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