Implications for the restoration of susceptible species

Kenton Sena*, Tyler Dreaden, Ellen Crocker, Kevin Yeager, and Chris Barton
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

Figure credit: Hardham, 2005

Figure credit: Redondo et al. 2015
AMERICAN CHESTNUT: A ONE-TWO PUNCH
DETECTING P. CINNAMOMI

Streamlining screening for large sample numbers
Composite soil sample

Bait with leaf

Transfer bait to selective media

Bait with rhododendron leaf

Extract DNA from bait discs

Screen with PCR Assay
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
Aerial photos from Bent Mountain—at construction and 14 years later
y = -0.0045x^2 + 0.1687x + 0.0638
R^2 = 0.6442
p = 0.076
MINE SOIL DEVELOPMENT
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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REFERENCES