

# Sudden Oak Death: Small Parcel Management



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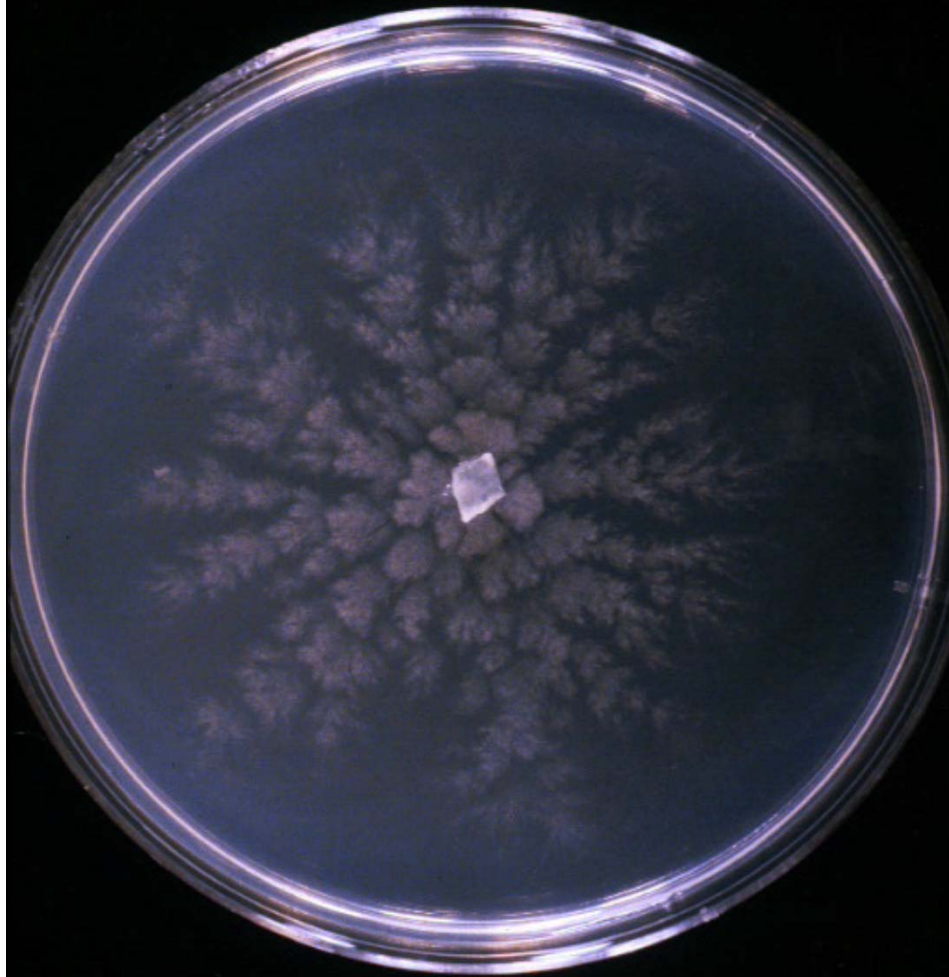
UCCE Marin & Sonoma Counties

# Sudden Oak Death

- Caused by *Phytophthora ramorum*
  - Fungus-like organism
- 2 Diseases
  - Foliar blight (huge host list)
    - Nursery issue
  - SOD (kills oaks, tanoak)
    - Wildland issue
- Spread
  - Local: wind driven rain
  - Distance: people
    - Infected plants
    - Shoes & tires
    - Livestock



# *Phytophthora ramorum*



*Phytophthora ramorum* in culture

Sporangia releasing zoospores



Chlamydospores





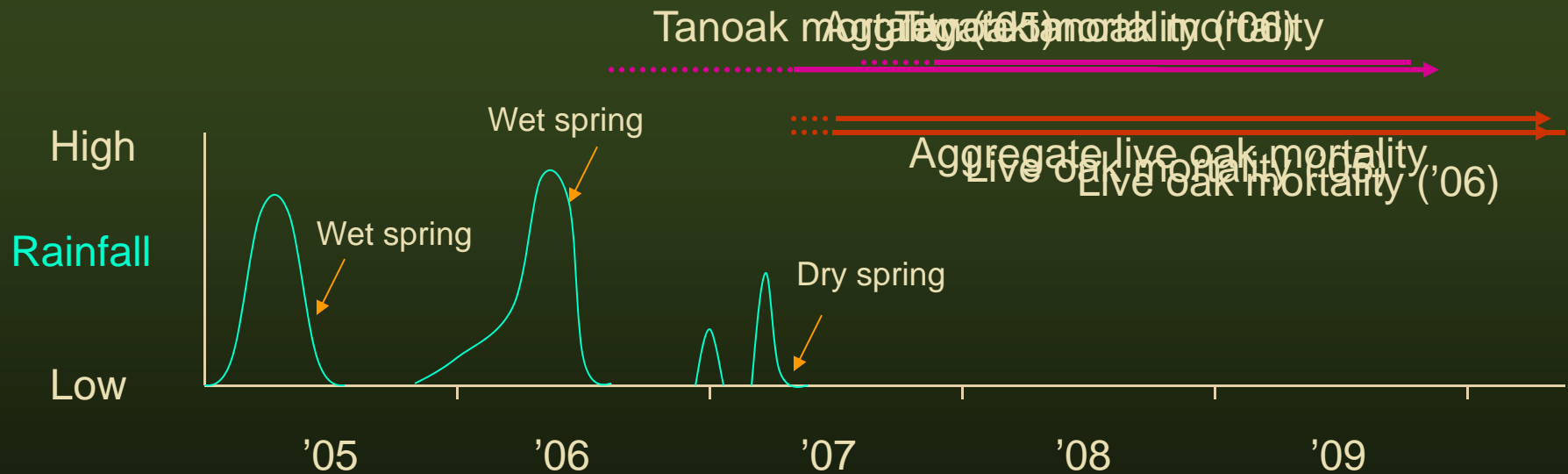
# Impacts

- 1 million trees killed & 1 million currently infected
- 2,000,000+ acres affected
  - < 10% of high risk forest
- Ecology – forests look and act differently, wildlife impacts
- Safety – Hazard trees, fire dangers
- Economics – Costs of mitigation & quarantines, tree removals
- Emotional – individual property owners, recreational users

# Oak Death Timeline

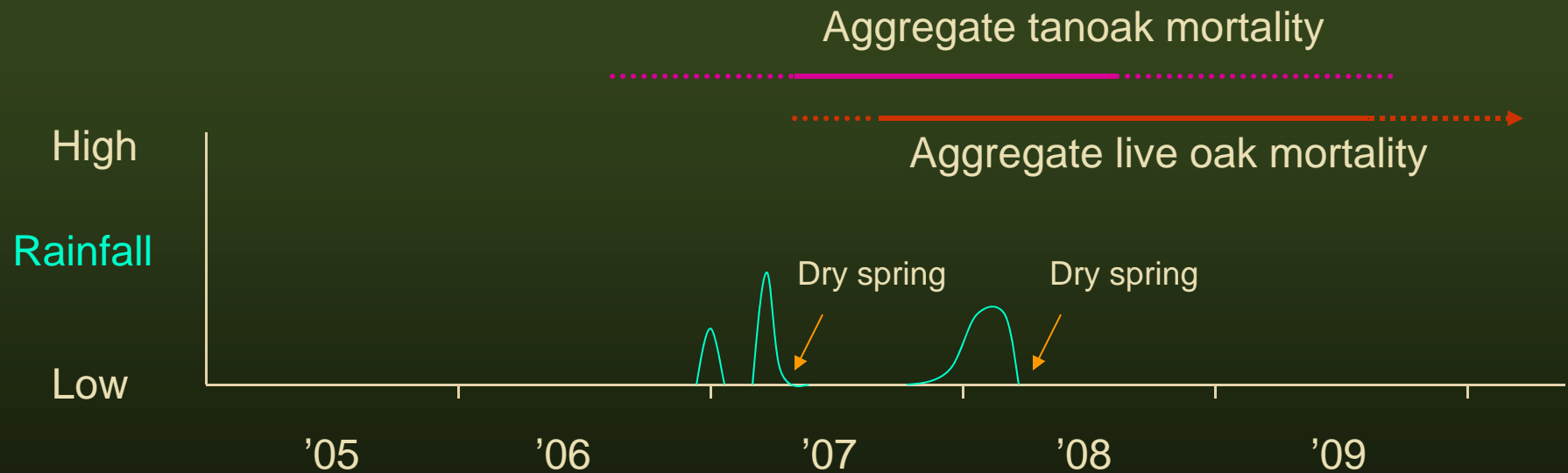
## – Infection:

- Wet springs
- Tanoak mortality: 1-2 years
- Coast live oak mortality: 2-3 years
- Cryptic Infection



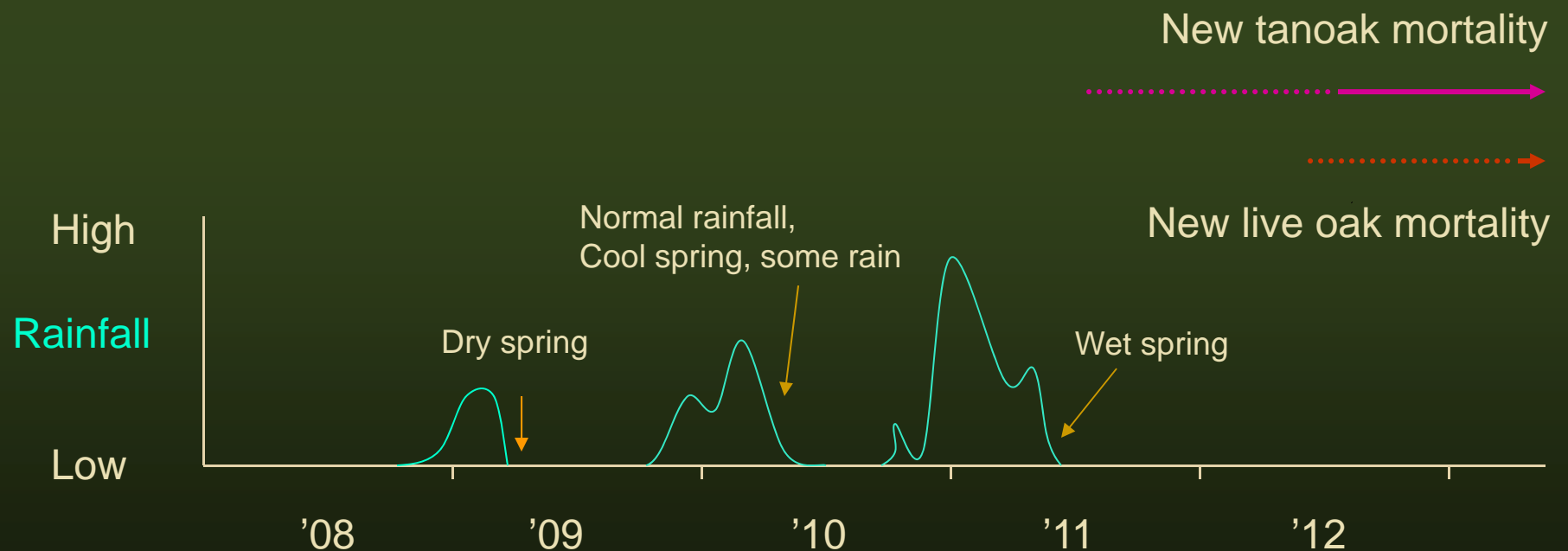
# Oak Death Timeline

- Mortality rates will drop off with more dry springs
- Mortality rates increase following wet springs



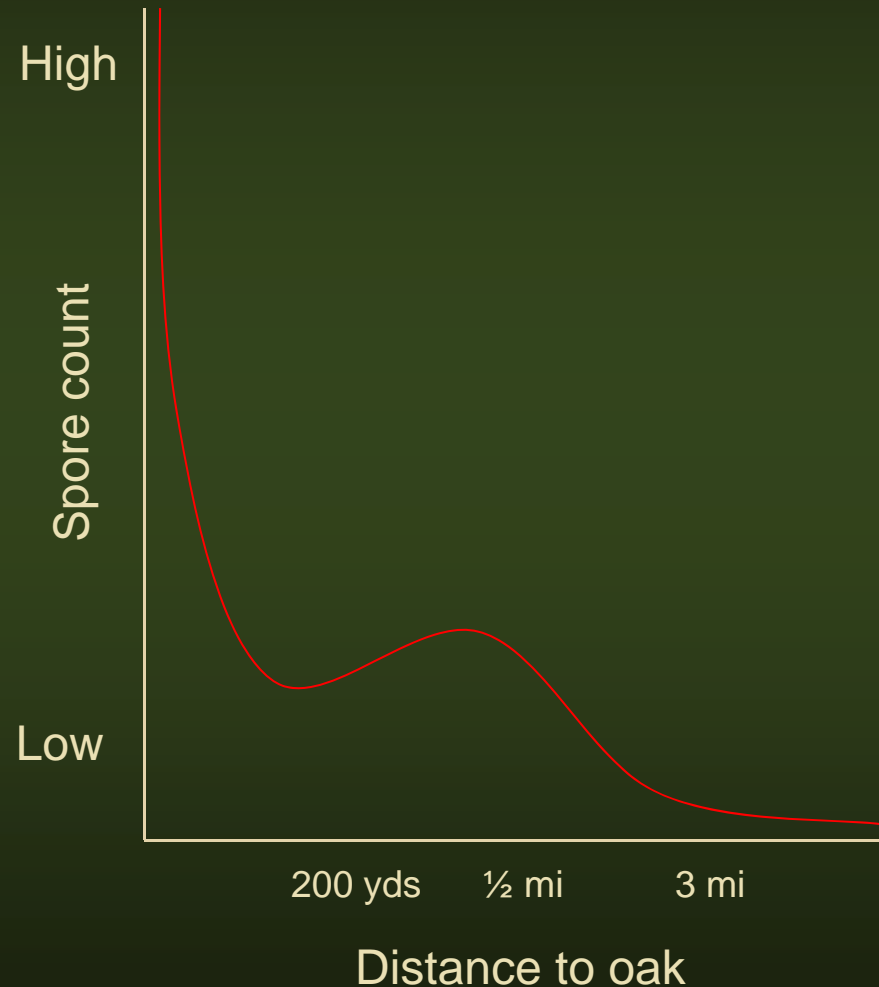
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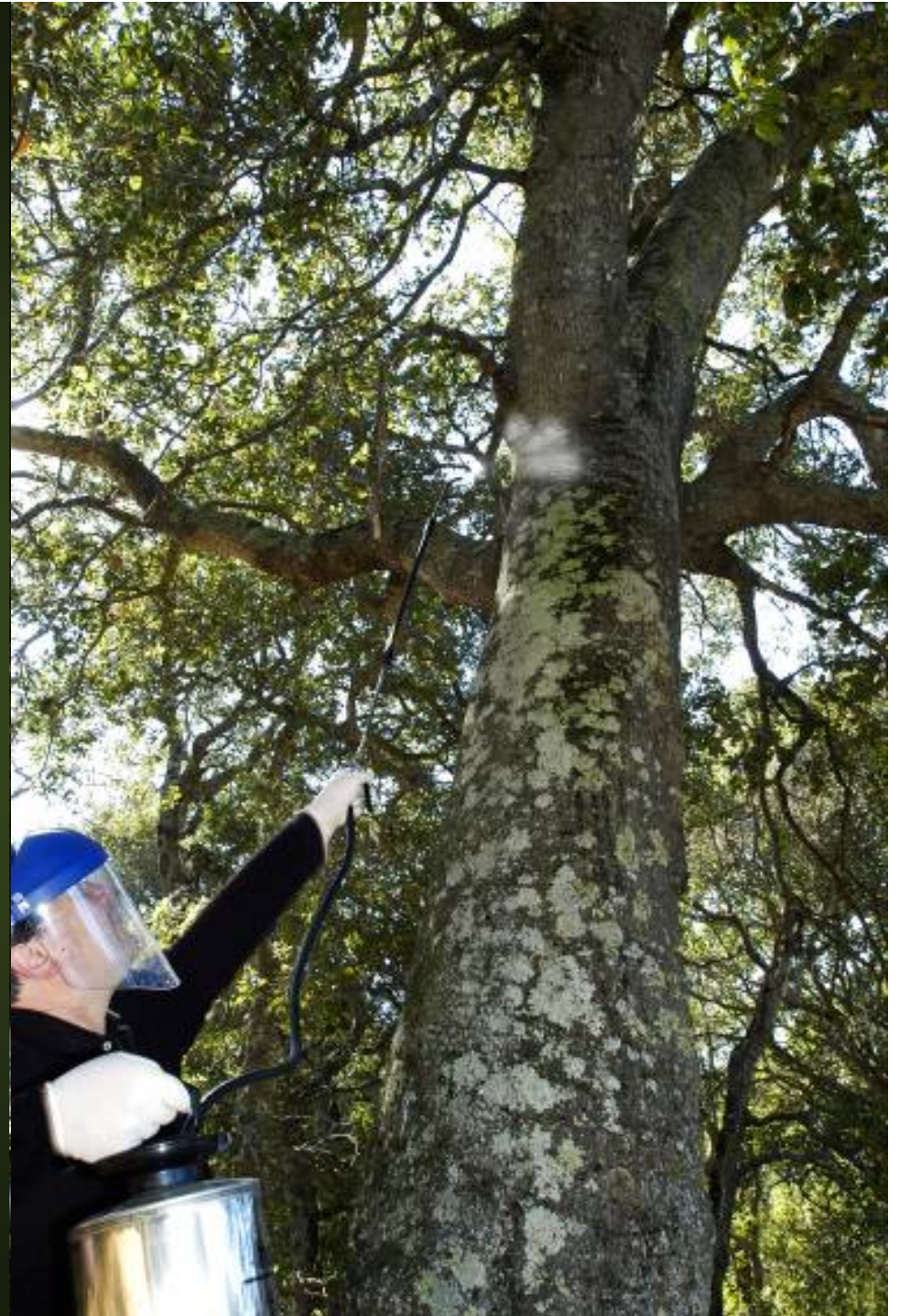
# Distance to spore source

- Foliar hosts near true oaks high risk
  - Some risk even at larger distances
- Not as relevant for tanoaks
  - Foliar host itself
  - Self infection



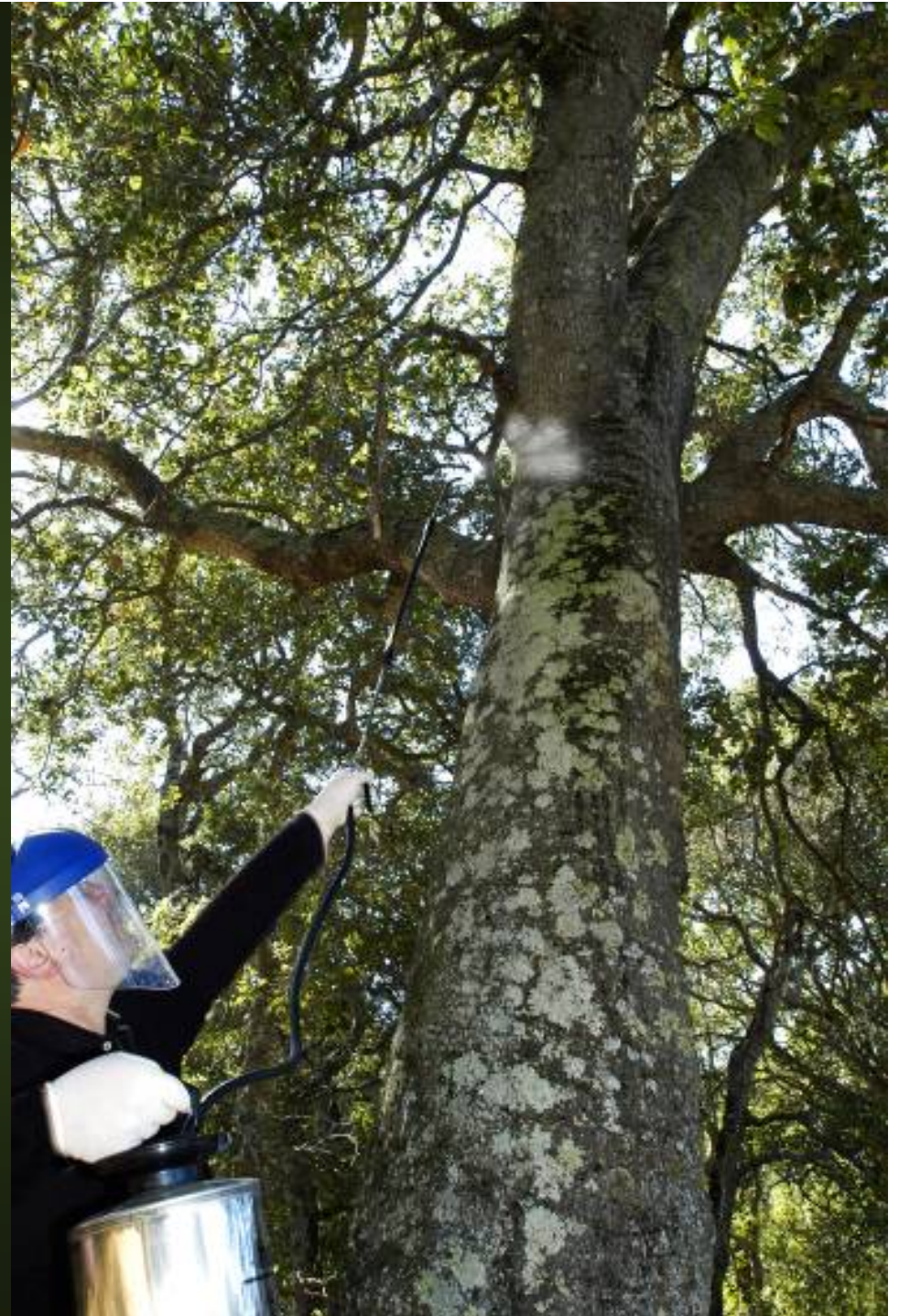
# Preventative treatment

- Phosphonate (AgriFos)
  - Injectible
    - Higher dosage
    - Wounds tree
    - Slow application
  - Surface application
    - Lower dosage
    - Simple application
    - Moss burn
      - Understory leaf burn
  - Specimen trees
  - Absorbed by the tree, taken up into the leaves, and returned to entire plant
  - Inhibits fungal growth and activates the plant's own natural defensive response



# Application timing

- Changes over time as we learn more
- Currently:
  - Spring and fall
  - First two
    - 6 months apart
  - All subsequent
    - 12 months apart



# Application timing

- Flexibility
- Variables:
  - Application technique
  - Tree size (age)
  - Inherent resistance





# Phosphonate limits

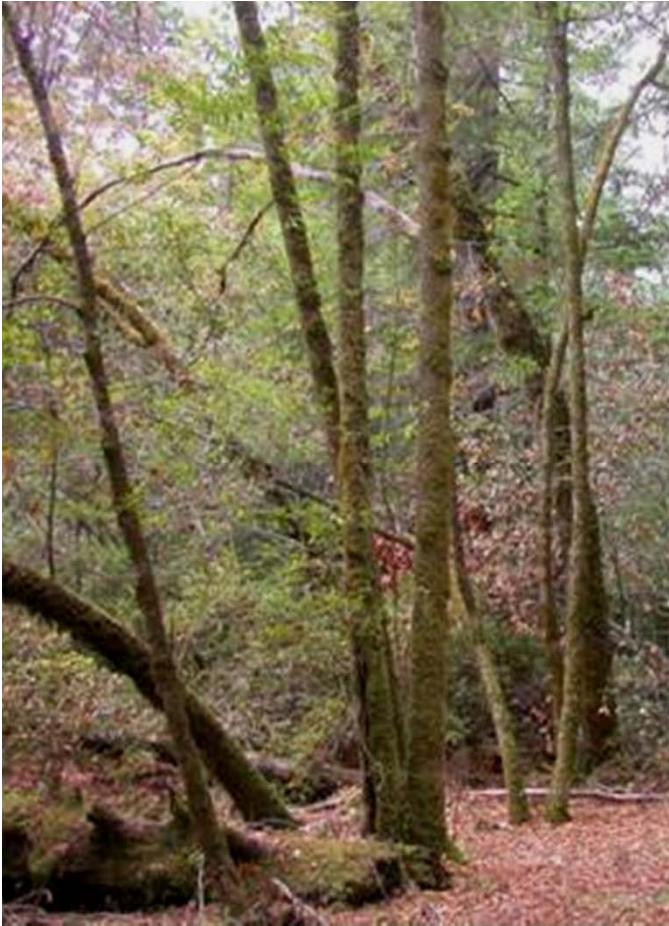
- Helps bolster tree's natural defenses
  - Weak tree = weak effect
- Better as prophylactic
  - Not great curative
  - Treat ahead of time
- Useless on infected tanoaks
  - Cryptic infection



## Some oaks already resistant

- Continual re-infection from nearby bay laurels means they eventually succumb
- Removal of bays may help these oaks survive

# Bay laurel thinning / removal



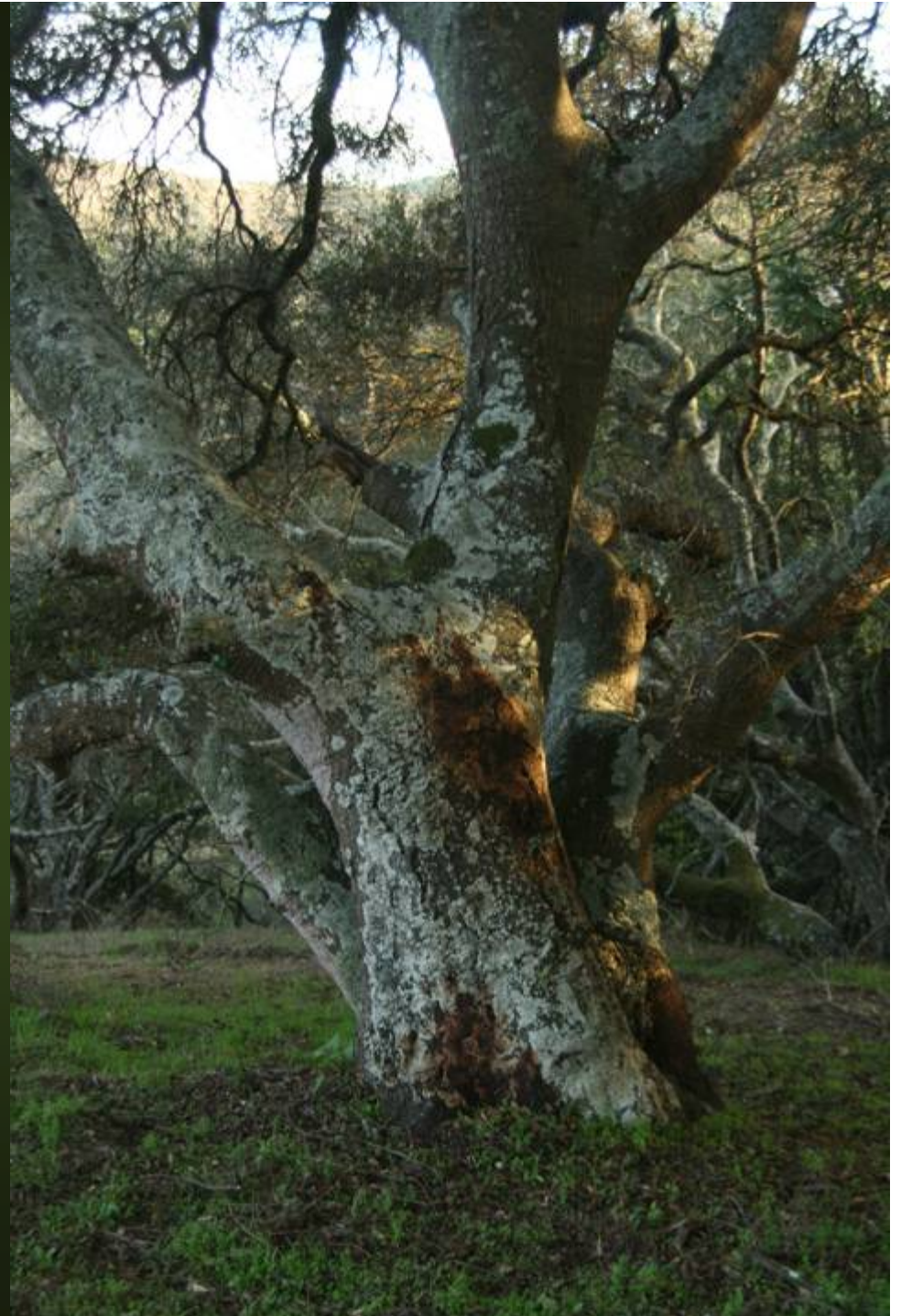
Before



After

# “Alternative” treatments

- Forest decline claim
- Soil acidification claim
  - Acid rain
  - Mosses and lichens
- No scientific data
- Probably won't hurt anything
  - Soil test?



# Bark scribing

- Potential “new” technique being evaluated
- Early trials show some promise
- Cankers may need to be small



# Presidio find

- No bays anywhere close
- Toyons quite close
- Genetic fingerprint matches nursery type, not wild type
  - Neighbor across street had infected landscape plants in 05 & 06
  - Rain years!
- Suggests “bay” focus might be a little myopic





# What if they're already dying?

- Evaluation
  - Hazard
  - Fire
- Removal plan
  - Not always necessary
- Reforestation
  - Right tree, right place



# Hazard trees

- No target? No hazard
- Hazard warnings:
  - *Hypoxylon*
    - Sapwood decay
  - Ambrosia beetle
    - Gallery builder
      - Tan frass in cracks
    - *Ambrosiella* fungus
  - Native organisms
    - Failure when still green

# Disposal

- Quarantine
  - Don't move infected material out of county
- Best left on site
  - Wrap cut wood in clear plastic?
  - Lop brush to ground
- Composting at commercial facilities
- Landfill only if in compliance





# Oak Mortality

- Follows wet springs
  - 1 to 3 year symptom lag
- AgriFos
  - Preventative
  - Two methods
  - Cryptic infection
- Laurel removal
- Beetles/Hypoxylon
  - Consider removal
- Disposal
  - Keep on site

# Resources

- [www.suddenoakdeath.org](http://www.suddenoakdeath.org)
- Janice Alexander: [jalexander@ucdavis.edu](mailto:jalexander@ucdavis.edu)  
415 473 4204
- Steven Swain: [svswain@ucdavis.edu](mailto:svswain@ucdavis.edu)  
415 473 4226
- This Powerpoint on-line (for the next month) at:  
<http://ucanr.org/solanosod>