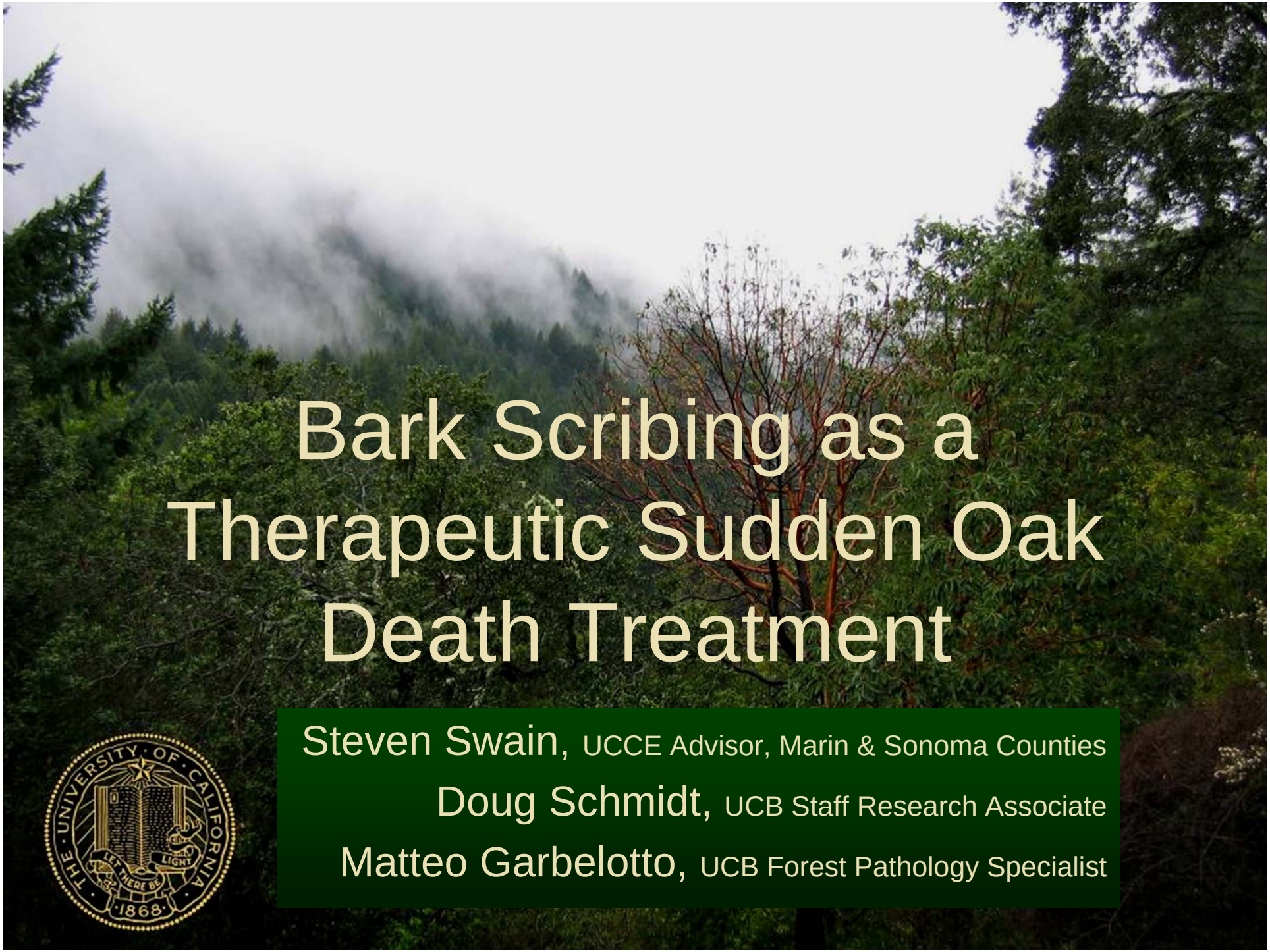

Bark Scribing as a Therapeutic Sudden Oak Death Treatment

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SOD Testing

- Delimit extent of SOD infections around 1999-2001
- Directly testing oaks
  - Required cutting into bark
  - Some trees appeared to subsequently recover
  - Led to Pavel's hypothesis that scribing may be a treatment

Bark Scribing

- UC IPM lists as a treatment for Phytophthora infected citrus
- Standard practice since early 1900's?

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Citrus

Phytophthora Gummosis

Pathogen: *Phytophthora* spp.
(Reviewed 9/08, updated 9/08)

In this Guideline:

SYMPTOMS

An early symptom of Phytophthora gummosis is sap oozing from small cracks in the infected bark, giving the tree a bleeding appearance. The gumming may be washed off during heavy rain. The bark stays firm, dries, and eventually cracks and sloughs off. Lesions spread around the circumference of the trunk, slowly girdling the tree. Decline may occur rapidly within a year, especially under conditions favorable for disease development, or may occur over several years.

COMMENTS ON THE DISEASE

Phytophthora fungi are present in almost all citrus orchards. Under moist conditions, the fungi produce large numbers of motile zoospores, which are splashed onto the tree trunks. The *Phytophthora* species causing gummosis develop rapidly under moist, cool conditions. Hot summer weather slows disease spread and helps drying and healing of the lesions.

Secondary infections often occur through lesions created by *Phytophthora*. These infections kill and discolor the wood, in contrast to Phytophthora infections, which do not discolor wood.

MANAGEMENT

Management of Phytophthora gummosis focuses on preventing conditions favorable for infection and disease development. All scion cultivars are susceptible to infection under the right environmental conditions.

Cultural Control

Plant trees on a berm or high enough so that the first lateral roots are just covered with soil. Correcting any soil or water problems is essential for a recovery. In addition to improving the growing conditions, you can halt disease spread by removing the dark, diseased bark and a buffer strip of healthy, light brown to greenish bark around the margins of the infection. Allow the exposed area to dry out. You can also scrape the diseased bark lightly to find the perimeter of the lesion and then use a propane torch to burn the lesion and a margin of 1 inch (2.5 cm) around it. Recheck frequently for a few months and repeat if necessary.

Organically Acceptable Methods

Cultural controls and copper treatments are acceptable for use on organically certified citrus.

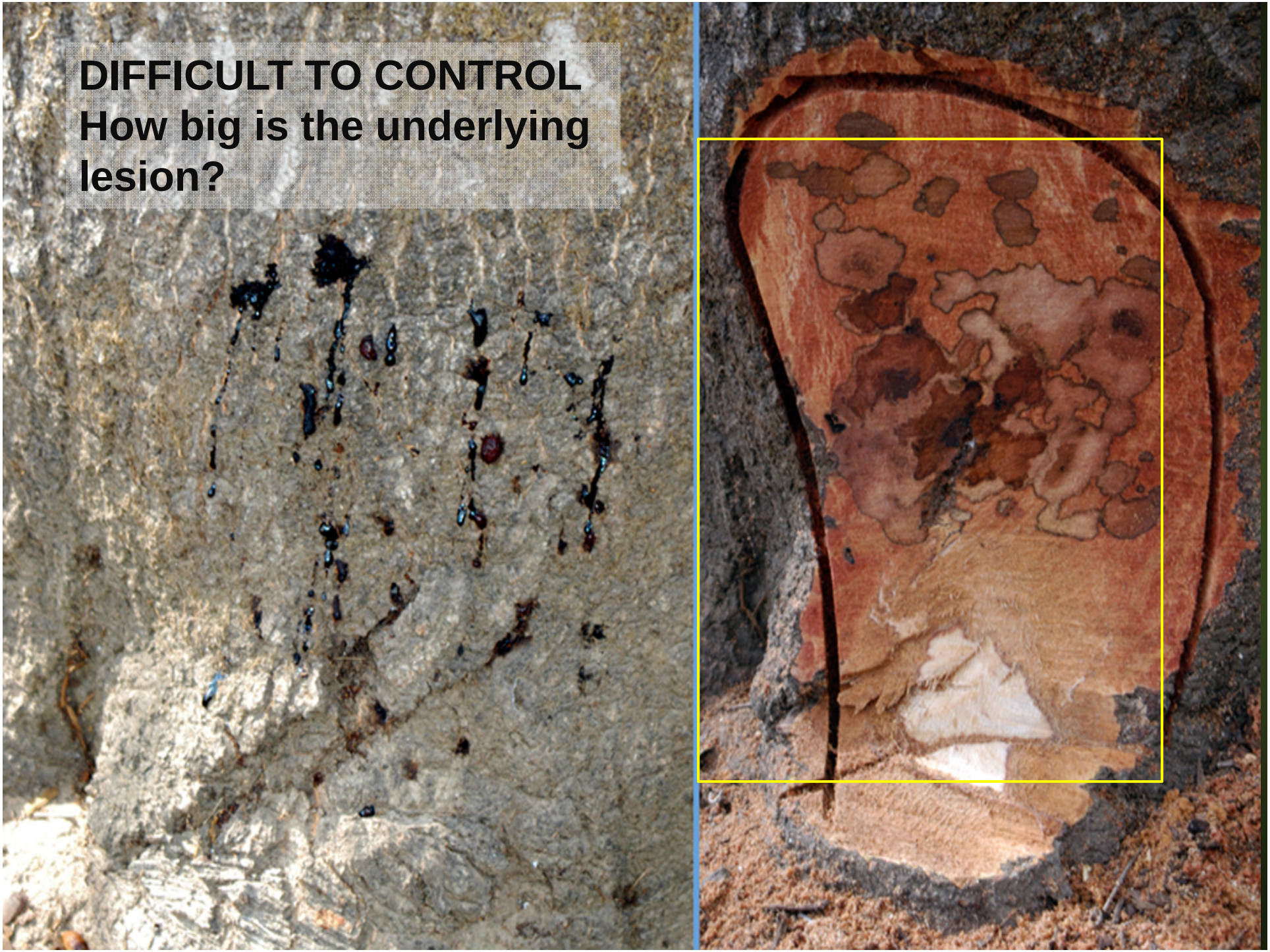
Monitoring and Treatment Decisions

Late stages of Phytophthoragummosis are distinct, but early symptoms are often difficult to recognize. Yet early detection and prompt management actions are essential for saving a tree. If 50% or more of a trunk or crown region on a mature tree is girdled, it may be more economical to replace the tree than to try to control the infection.

When establishing a new orchard, carefully check the lower trunk and rootstock of new trees for any symptoms of gummosis before you plant. When trees are wrapped in burlap, open and inspect a representative sample (at least 10% of the trees). When planting or replanting in soil infected with *Phytophthora*, or when a susceptible rootstock has to be used, fumigation may be helpful.

Pilot Studies?

- 200 trees treated
  - Private properties
  - Experimental control problematical
    - No controls in place
  - Pavel Svihra believed scribing worked on SOD infected oaks …
    - If lesions are small
    - Pavel retires 2005
    - No publication of results


DIFFICULT TO CONTROL
How big is the underlying lesion?


Control?
• Thermography
• Brute force (100’s of reps)

Industry Adoption

- Word got out that scribing worked …
- There is no controlled data to back up the claim
- There was a big demand for treatment
  - AgriFos didn’t always work

Outline

- Scribing, but no phosphonate
  - Better statistically
  - Already have phosphonate efficacy data
  - If scribing is effective, it should show efficacy on its own

M&M's

- 60+ trees at 3 sites
  - Some trees w/ multiple branches
- Infect branches on mature trees
  - Known size at time zero for treatments and controls
    - + Control
    - - Control
    - Treatment
    - 1-2 (+) & (-) backups

M&M's

- Check infection progress using backups
- Harvest treatments when lesions are > neg. control
  - We planned on one year
  - It took two
- Harvest + controls one year after that

Results

- Doing nothing works great …
  - Lots of + controls fail to thrive
  - Lots of treatments fail to thrive
  - No statistical difference
- Except when it doesn’t
  - Several trees killed (by ?)

Results

- Scribing seems to take credit for trees defending themselves
  - Trees frequently kill small lesions
    - At least during drought
  - Large lesions found on trees that can’t kill
  - Sound familiar?
- Consistent with Ted Swiecki’s work

Bark Scribing

- UC IPM lists as a treatment for Phytophthora infected citrus
- Standard practice since early 1900's?
- Efficacy documented in the literature?
  - Nope.
- Current evaluation?
  - Ventura Citrus Advisor Ben Faber: "Do you believe in myths?"

Food for thought

- We analyzed the prevailing method of scribing oaks
  - Most of the way through the bark
  - Other methods?
  - Synergy with phosphonates?

Conclusion

- No good evidence that bark scribing *alone* works as a treatment for SOD
  - Unlikely a significant contributor to other treatment strategies that use scribing
- Despite what's published by UC IPM, it may not work on citrus either

Thanks!

- www.suddenoakdeath.org
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