Phellinus Wood Rot Management Update

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Wood decay fungi in Prune: *Phellinus pomaceus*

(formerly *P. tuberculosus*)

Symptoms:

- Broken limbs, loss of major scaffolds
- Decayed wood
- General tree decline

Signs:

- Presence of fruiting bodies (“conks”)

Wood decay fungi in Prune: *Phellinus pomaceus*

- Appears to be associated with pruning wounds
- No known chemical controls

Wood decay fungi

- Traditionally considered non-aggressive diseases except in times of plant stress

- Research has focused on taxonomy

- Epidemiology and biology not well-studied

Understanding Transmission and Control of *Phellinus pomaceus* in Prune

2024 Objectives:

1. Serve as a resource for growers, farm advisors, and PCAs through identification of wood-decay, orchard evaluations, and outreach.

2. Conduct broad disease severity surveys to identify management outcomes

3. Conduct *P. pomaceus* spore surveys

4. Evaluate the effects of current biocontrol products

5. Determine infection entry points via destructive tree sampling

6. Evaluate differences in susceptibility to decay

Objective 1:

Serve as a resource for growers, farm advisors, and PCAs; Provide identification of wood-decay, orchard evaluations, and outreach.

2023 Update:

- Collaborating on UC IPM Pest Management Guidelines for *Phellinus pomaceus: d*iseases subchapter for Prune
- Handout developed for growers

Objective 2:
Broad disease severity surveys

Survey for disease severity

- Severity ratings: no. of conks, broken scaffolds, canopy uniformity
- Co-occurring infections
- Pruning strategies

Compare with:

- PUR (Pesticide Use Reports) data
  - Dormant Oil applications
- Irrigation strategies
- Environmental data:
  - HOBO sensors
  - Historical weather

Objective 2:
Broad disease severity surveys

2023 update:

18 Orchards surveyed, 3,200 trees

PUR data TBD

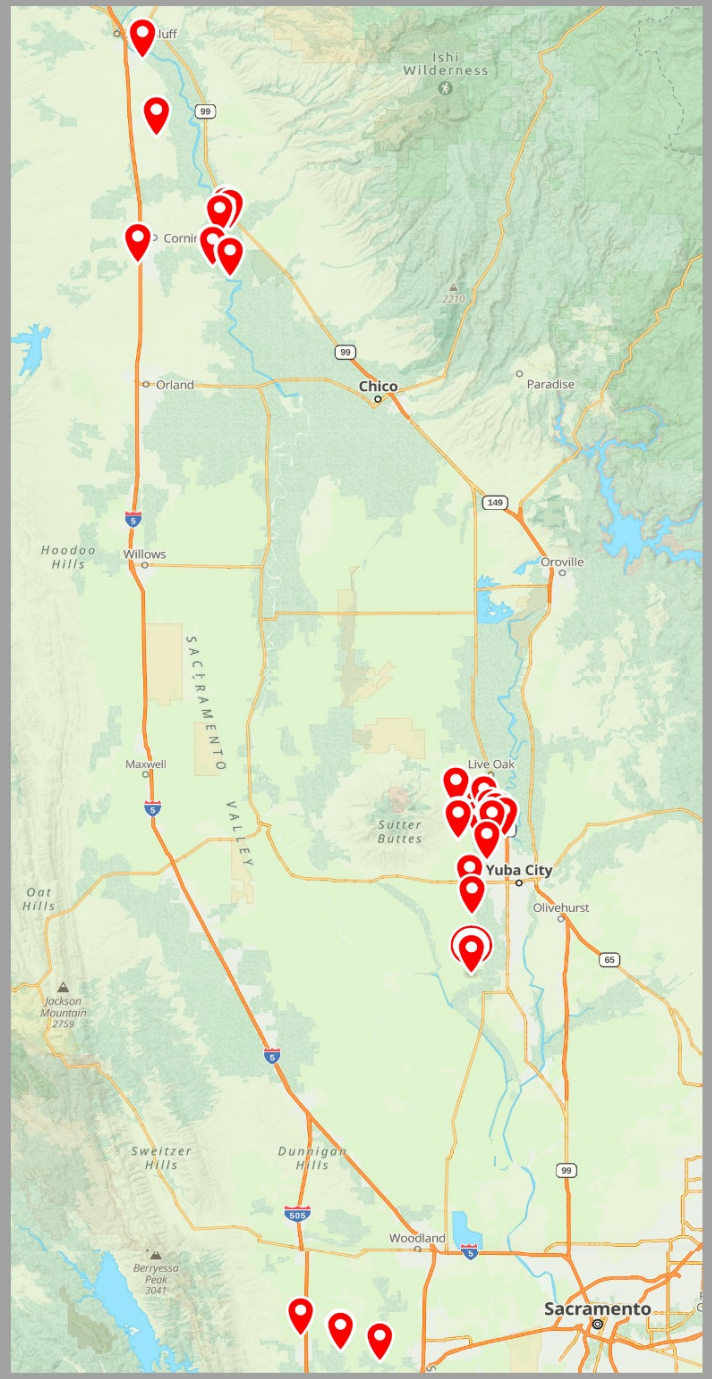
Soil and weather data TBD

High co-incidence of canker diseases in orchards that contain *Phellinus*

(R^2 = 0.19, p=0.06)

Pruning style is possible predictor of *Phellinus* presence

(R^2 = 0.27, p= 0.09)



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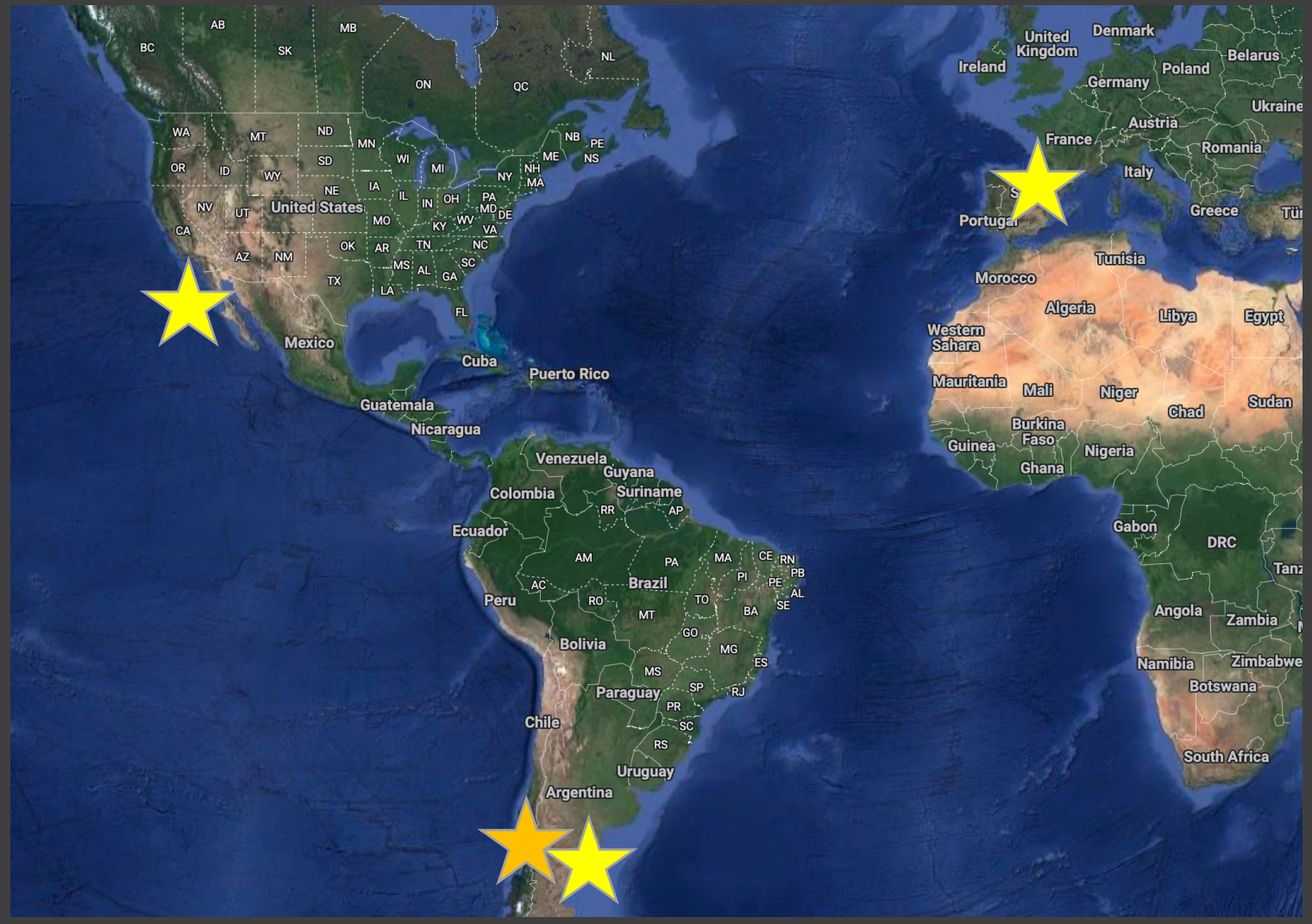
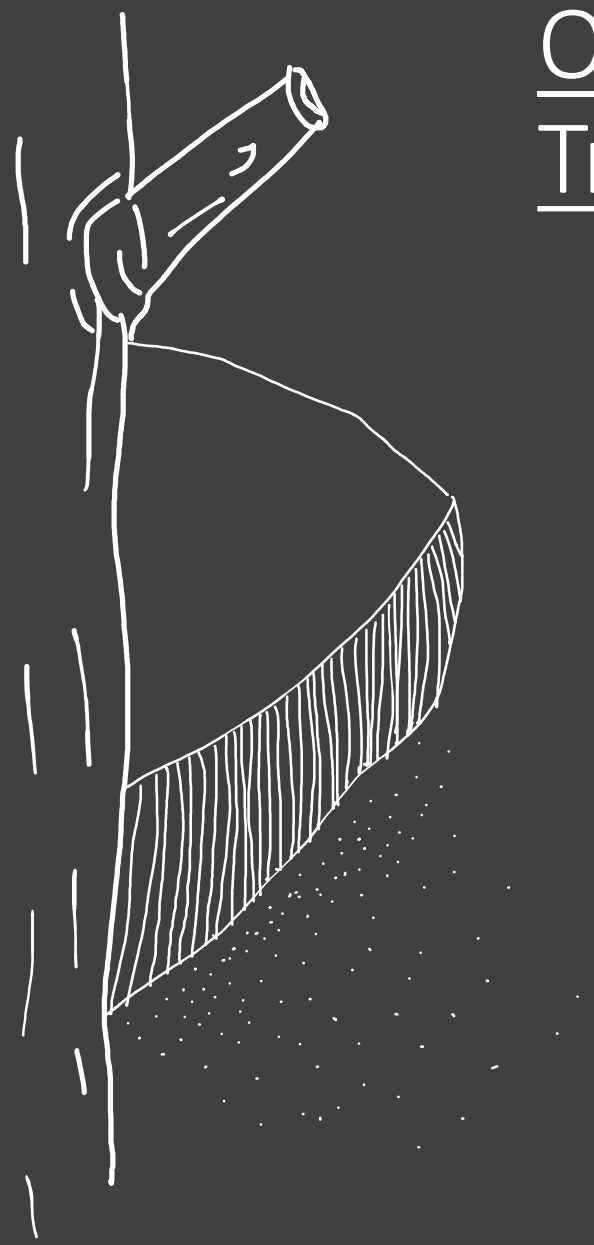
(Not enough data, TBD…)

Phellinus seen in other prune growing regions

- California
- France
- Argentina
- Chile?





Objective 3:
Tracking the spores of *P. pomaceus*

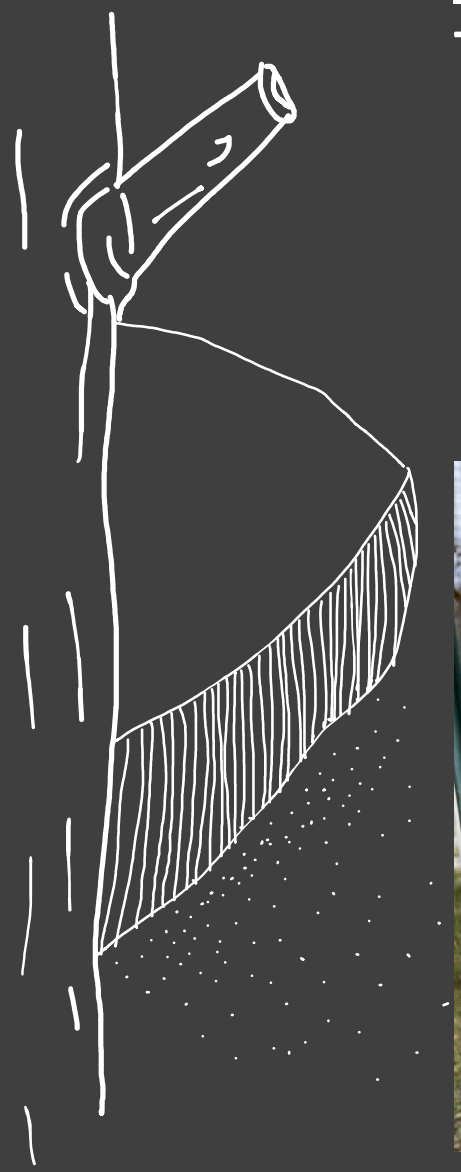
Goal: establish improved timing of pruning to minimize potential for infection

Many factors contribute to spore release patterns:

- Circadian
- Seasonal
- Lifespan (size dependency)
- Post-rain revival
- Environmental
  - Humidity, temperature, light
  - Landscape features
  - Seasonality

Objective 3:
Tracking the spores of *P. pomaceus*

- Production of new fungal material following rain events
- Potential peaks in **December, February**



Objective 3:
Tracking the spores of *P. pomaceus*

- 6 orchards, 14 sampling stations
- Every 2 weeks for 1 year
- Weather station in each

Objective 4:
Evaluation of Biocontrols

***Trichoderma* spray applications**

Previous work:

- Wood blocks in lab
- Pruning wounds at Wolfskill

Identified 2 top products:

- BioWorks “BW161”
- Belchim Crop Protection “Vintec”

Objective 4: Evaluation of Biocontrols: Ongoing field trials

1. Pruning Wound Protection Trial

- Initiated in 2019
- Annual applications on 5th leaf trees
  - Spray whole trees with products after pruning
  - Monitor whole orchards for signs of infection
- Will continue for 2024

Objective 4: Evaluation of Biocontrols: Ongoing field trials

2. Inoculum Reduction Trial

- Initiated in Fall 2022
- Spray applications of *Trichoderma* products on conks
- Observed changes in fruiting body

In Progress

Objective 5: Determine infection entry points via destructive tree sampling

31-yr-old orchard removed autumn 2023

15 trees, 50 limbs destructively sampled

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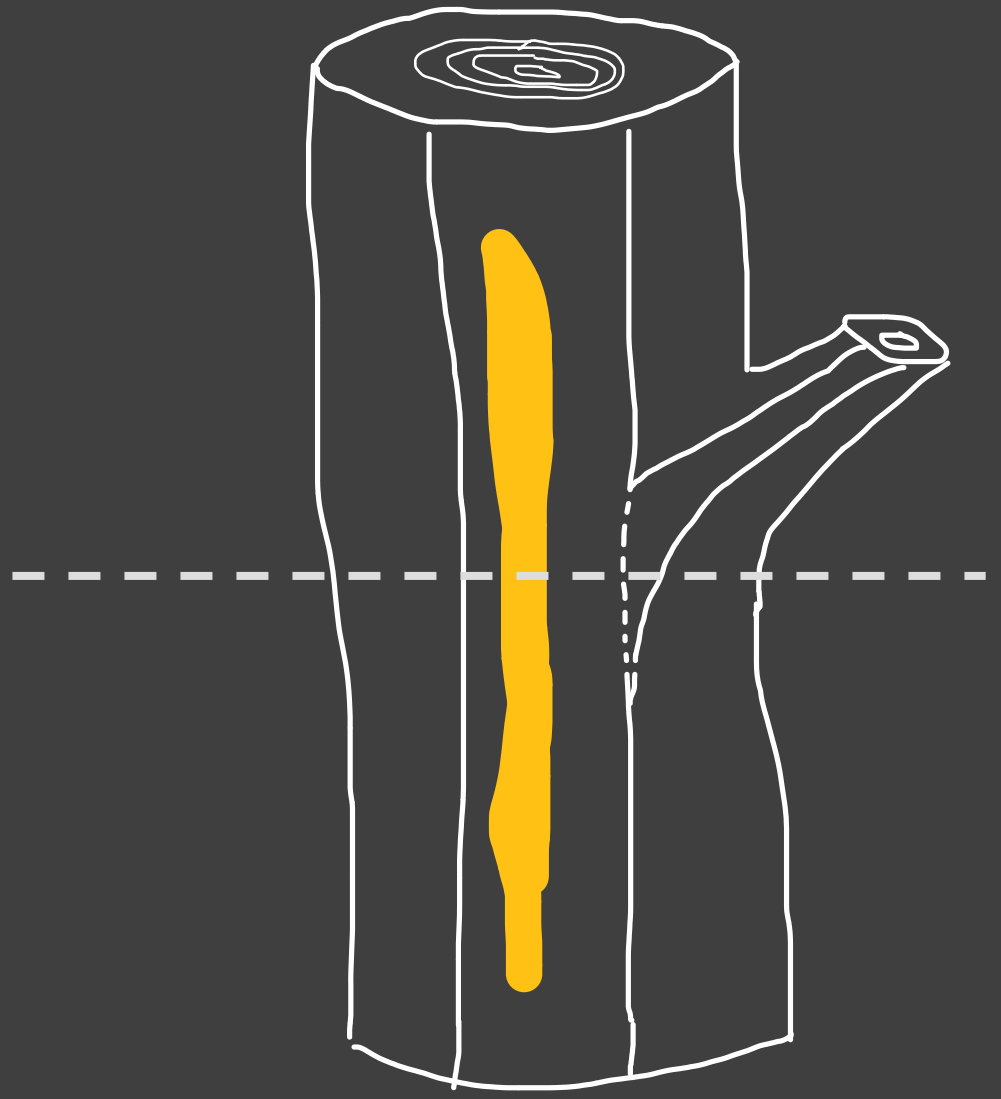
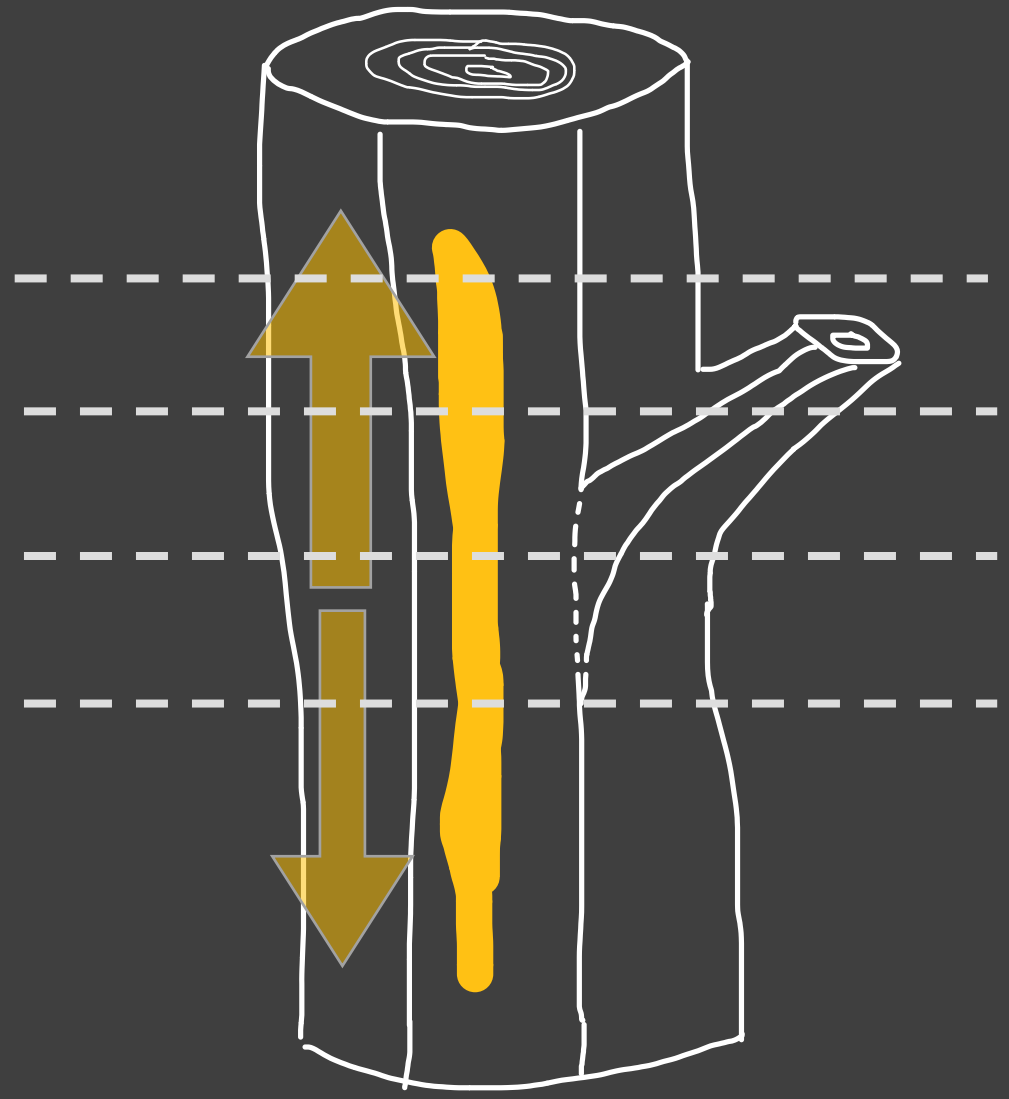
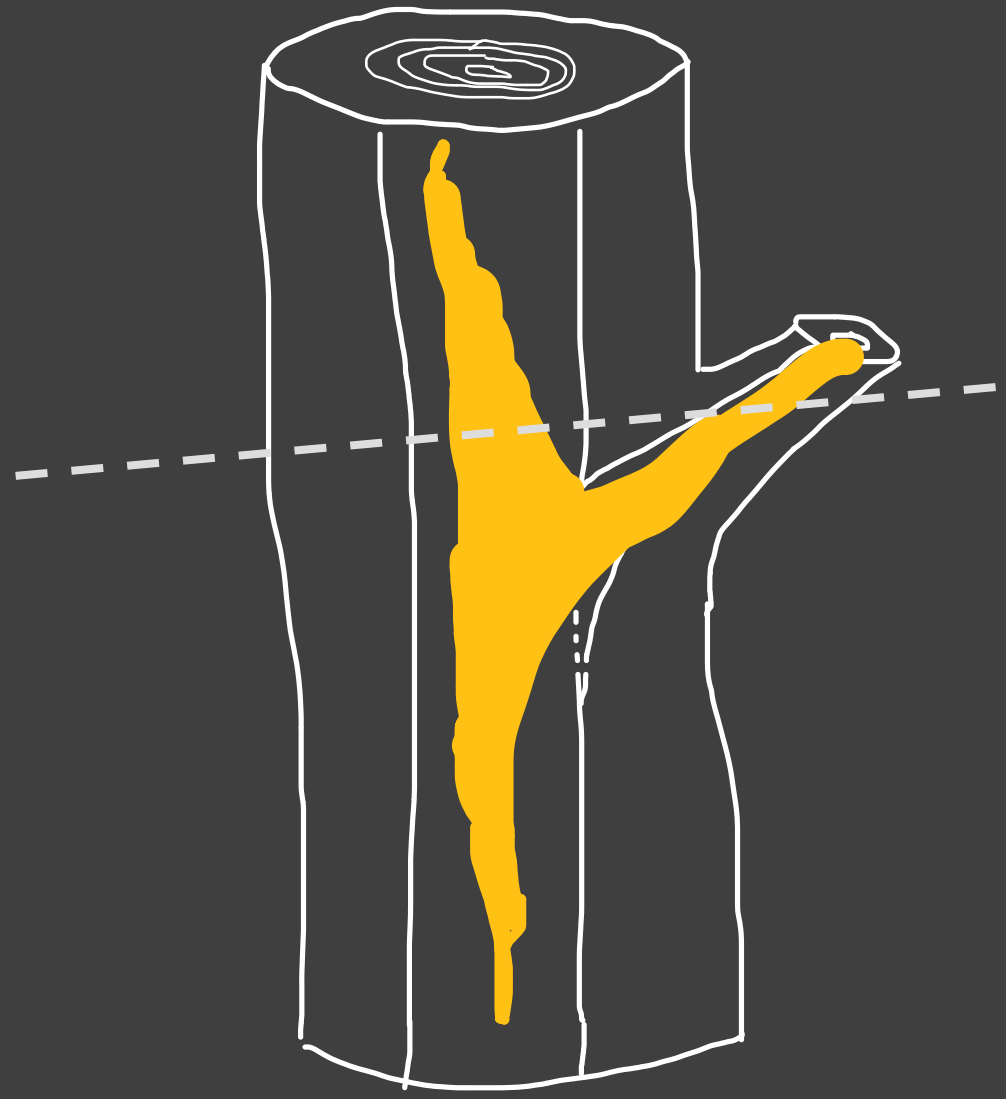






Determining infection entry points via destructive tree sampling

Branch with confirmed Phellinus infection	**Origin**
14	Pruning stub
4	Likely old pruning wound
2	Unknown wound
8	Unclear origin
total = 28	**64% from pruning wounds**
	90% known origins = pruning wounds



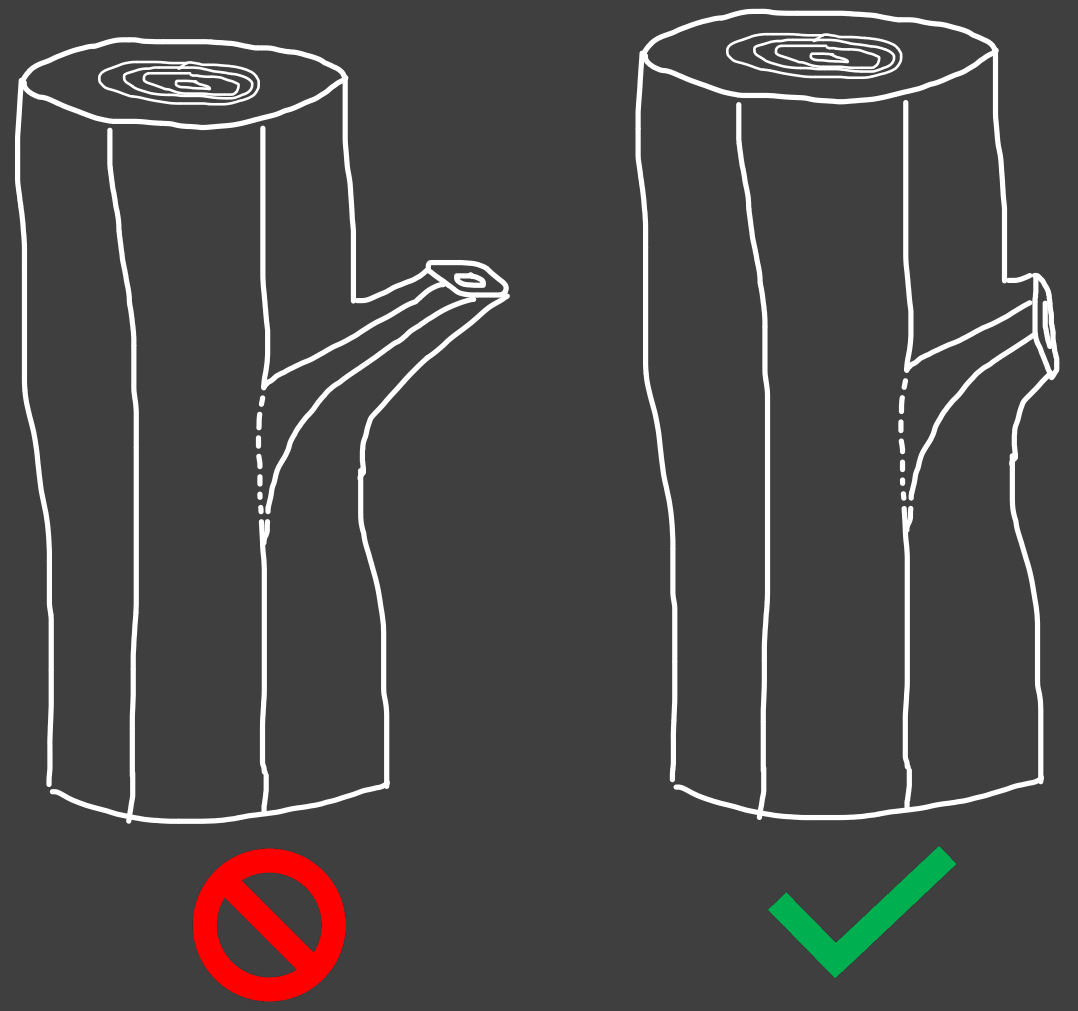


Preliminary data supports infection is associated with improper pruning methods

“Pruning stubs”

Training video for pruning crews?

- 2 minute youtube link
- Available in multiple languages
- Production help from CA Association of Resource Conservation Districts



Destructive tree sampling

Graft union dissection:

Cross section 3-5 inches above and below graft unions

Destructive tree sampling

Graft union dissection:

Cross section 3-5 inches above and below graft unions

#7 upper

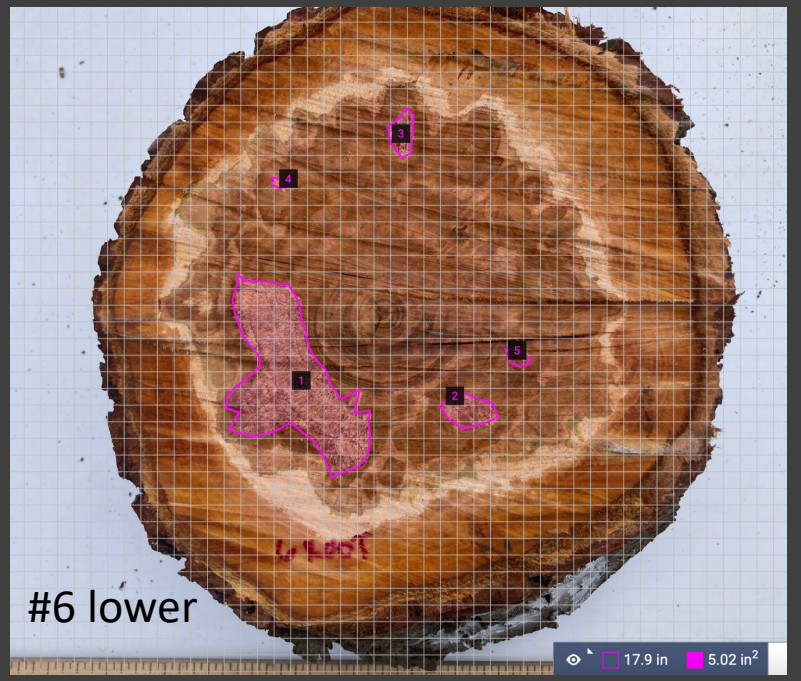
Scion Wood

#6 upper

#7 lower

Rootstock Wood

#6 lower



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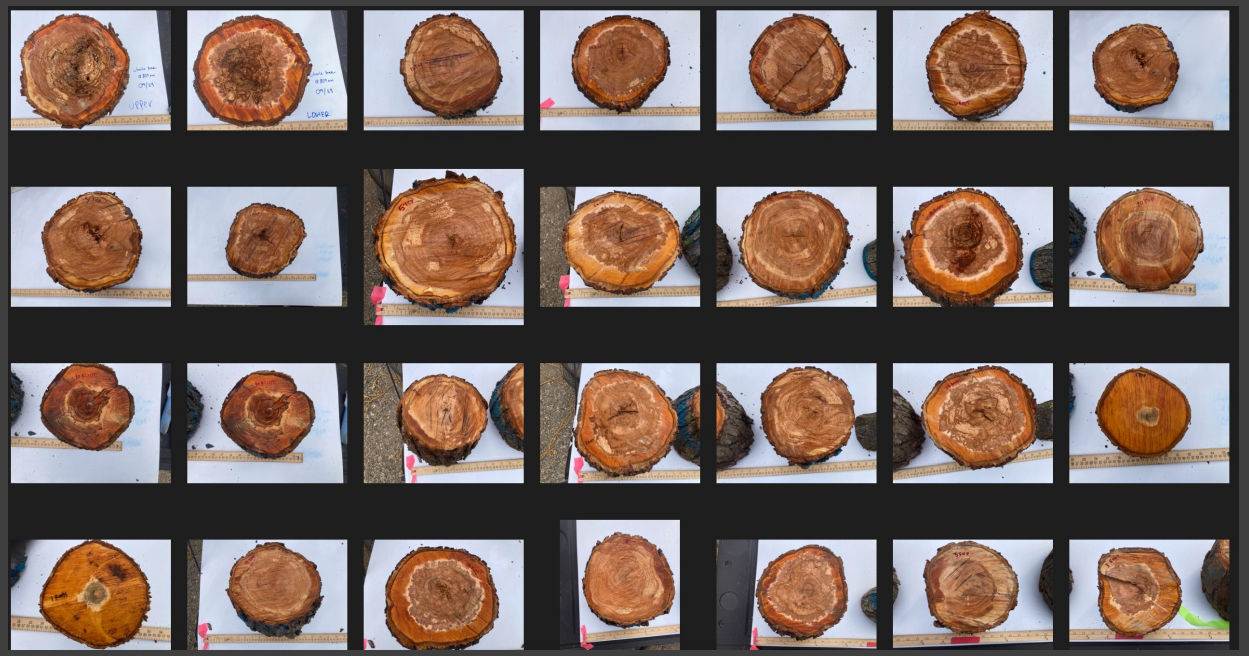

tree #	age	root sq in	scion sq in
1	young	0	0
2	med	5.1	3.2
3	old	0.5	0.4
4	old	4	2.5
5	old	7	6
6	med	5	12.6
7	old	24.1	14.3
8	old	27	23
9	old	13.3	12.1
10	young	0.5	0
11	old	18.8	21.1
12	old	2	6
13	old	28.4	29
		9.74%	

Objective 6: Evaluate differences in susceptibility to decay between varieties

Inoculate dried samples of wood blocks from:

- Prune Breeding program
- Peach
- Cherry
- Almond

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