

A photograph of a peach orchard with rows of trees under a clear blue sky. The trees are lush green and arranged in neat rows, with a dirt path or road running through the center. The lighting is bright, suggesting a sunny day.

# *Organic solutions* to peach Cytospora canker

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# Cytospora, in organic orchards!

*Do we have any solutions?*

- Lime sulfur
- Cutting it out
- .....?



# At WCRC-RM, we're working on it.

## 1. *Defense Priming*

- Can natural compounds known to elicit plant defense responses *prime* a tree against *Cytospora* infection?

## 2. *Organic Fungicides*

- Through the *IR-4 program*, we are testing organic fungicides that are known to be effective against other fungal pathogens but have yet to be tested on peach for *Cytospora* canker.

## 3. *Biological Antagonism*

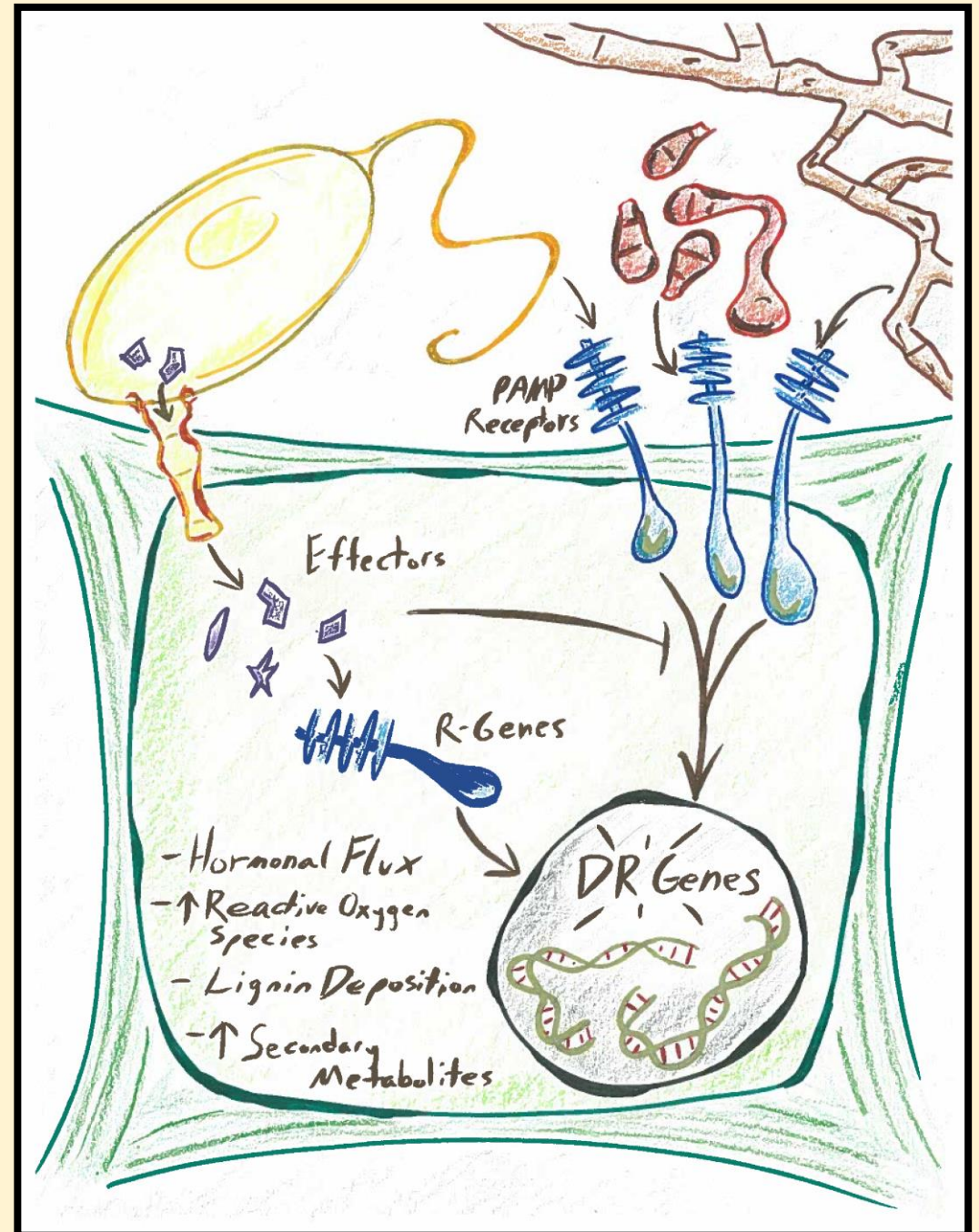
- Utilizing native microbes, such as *Trichoderma spp.*, to outcompete or act as an inhibitor to *C. plurivora*.



# 1. Defense Priming

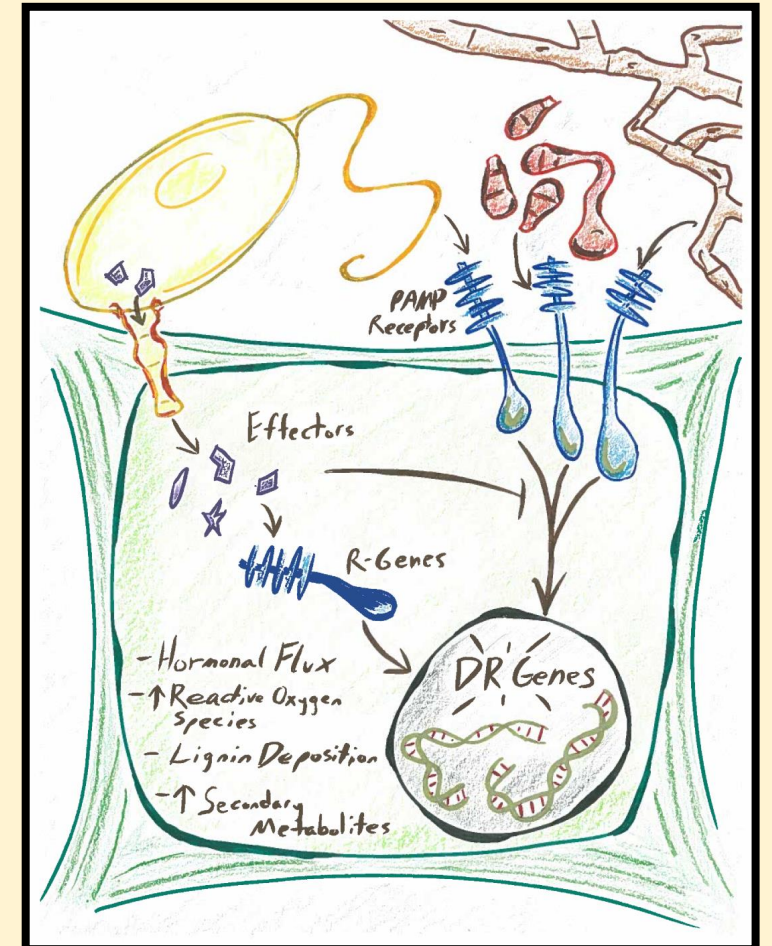
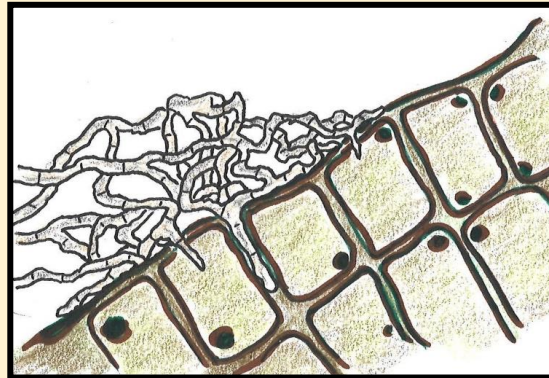
## The Plant Immune Response

- Pathogens are sensed by the plant cell
- The genome is called to activate Defense Response genes
  - Hormones signaling across the plant
  - Strengthening of cell walls
  - Peroxides to fight pathogens
  - Localized cell death

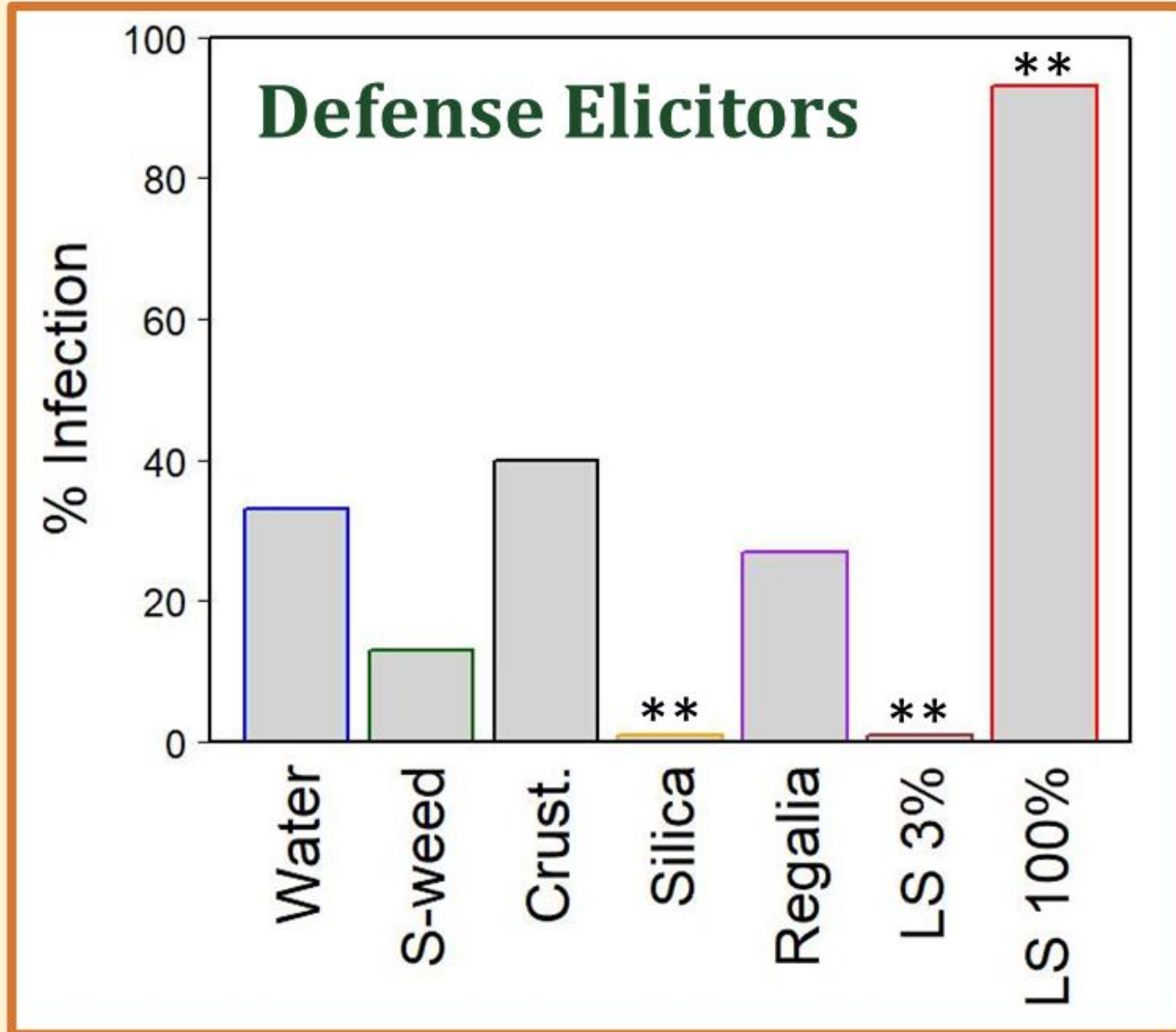


# Cytospora canker in peach: Fighting the disease using *defense priming*

- Using the natural plant immune response:
  - Elicit with organic substances such as seaweed powder, silicon, plant extracts, etc.
  - Wound spray treatment, then test by branch inoculation (1 week apart?)
  - Measure disease spread, infection occurrence
  - Potential for a new preventative spray measure



# Some defense priming compounds reduce infections



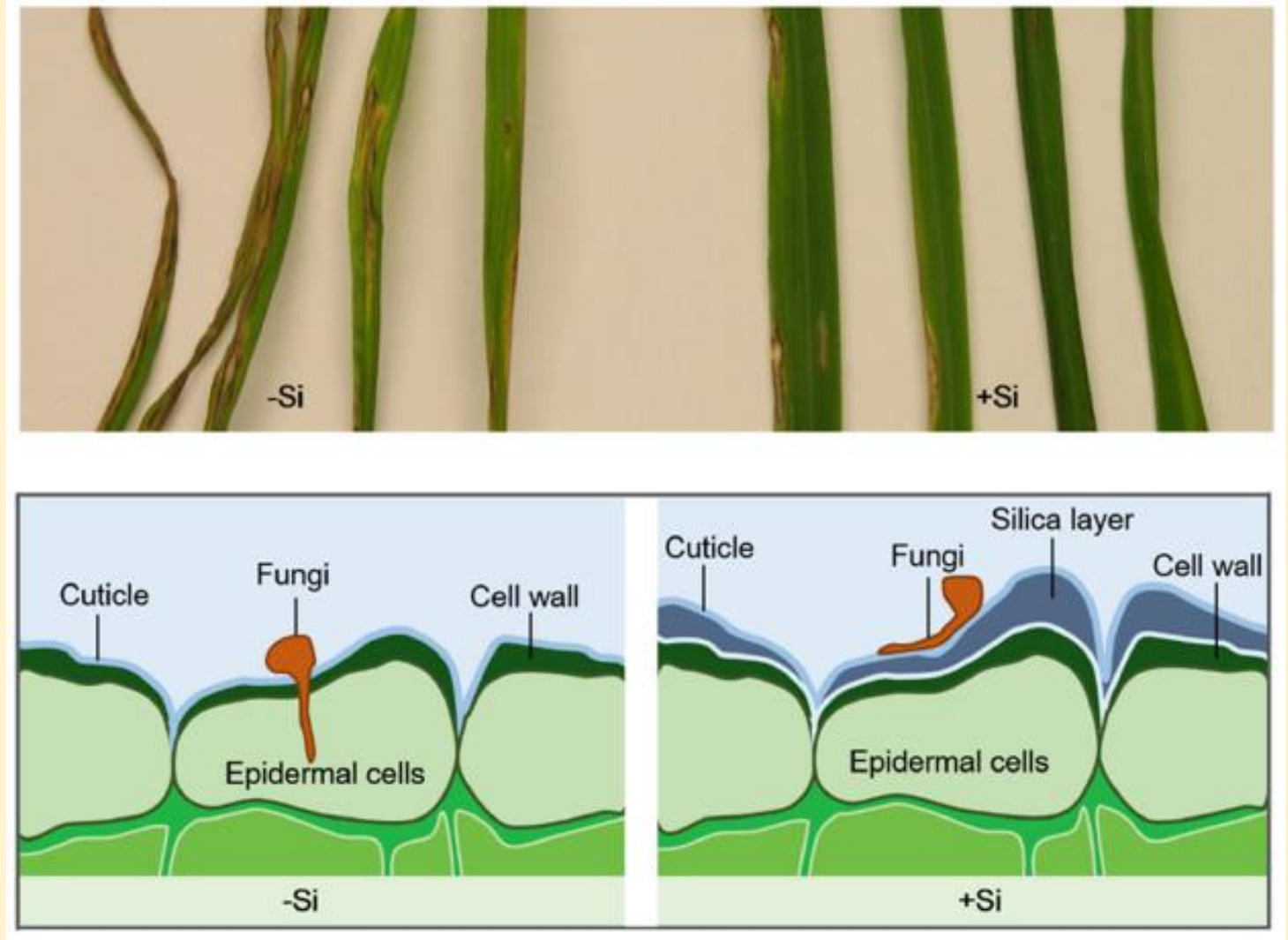
## *Conclusions*

- Defense elicitor, Silica, prevented infection, comparable to the industry standard, 3% Lime Sulfur.
- Lime Sulfur at 100% is phytotoxic. The extent of tissue damage is evident with high infection rates

# Why Silica?

- Abundant in rice and grasses
- Used as a protecting layer

**Application externally  
can cause more  
responses...**



# *The multiple defense priming avenues of Silicon*

## 1. Physical

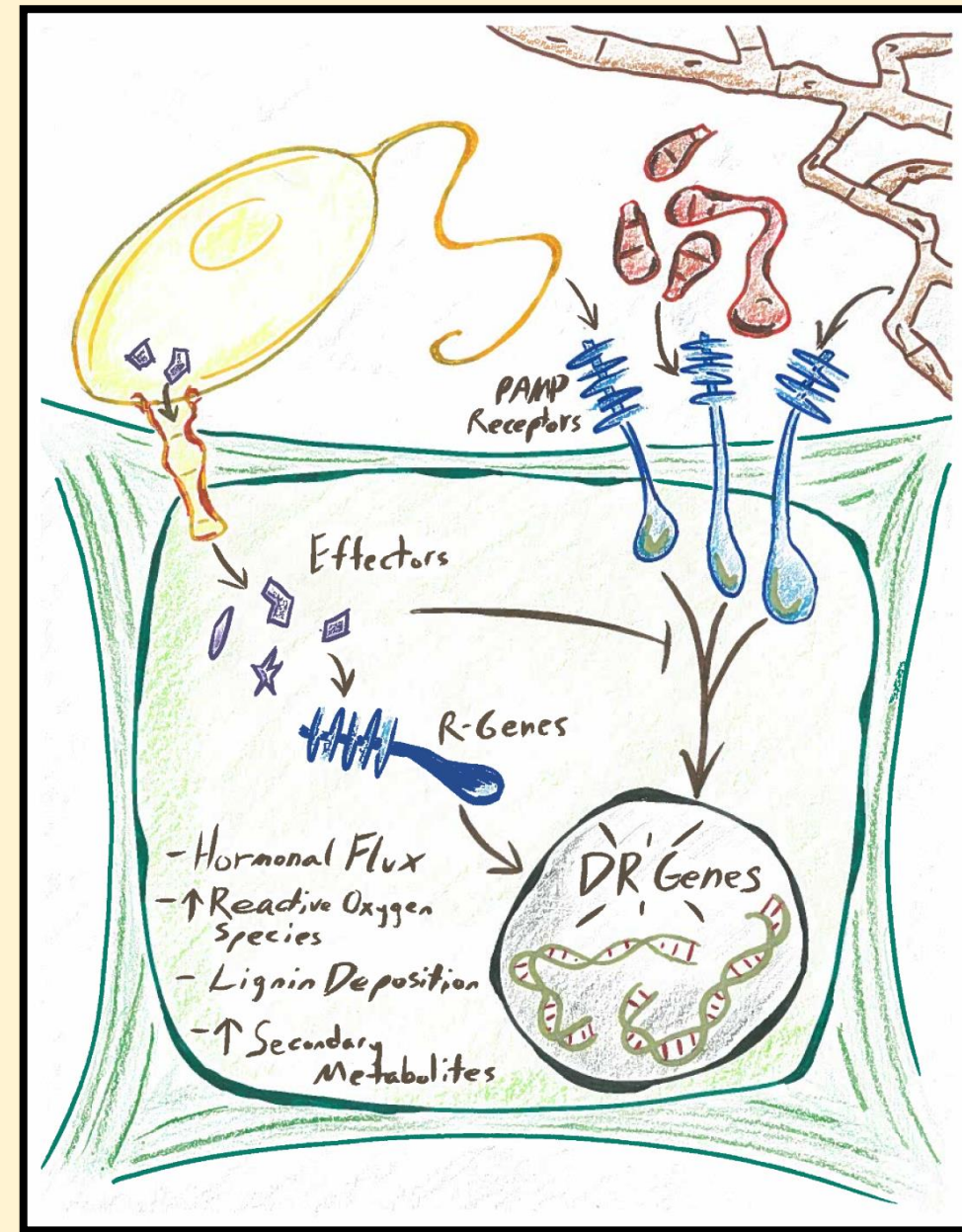
- Cell wall reinforcement

## 2. Biochemical

- Enzymes, antimicrobial compounds, hormones

## 3. Molecular

- Defense genes turn on





# *The multiple defense priming avenues of Silicon*

## 1. Physical

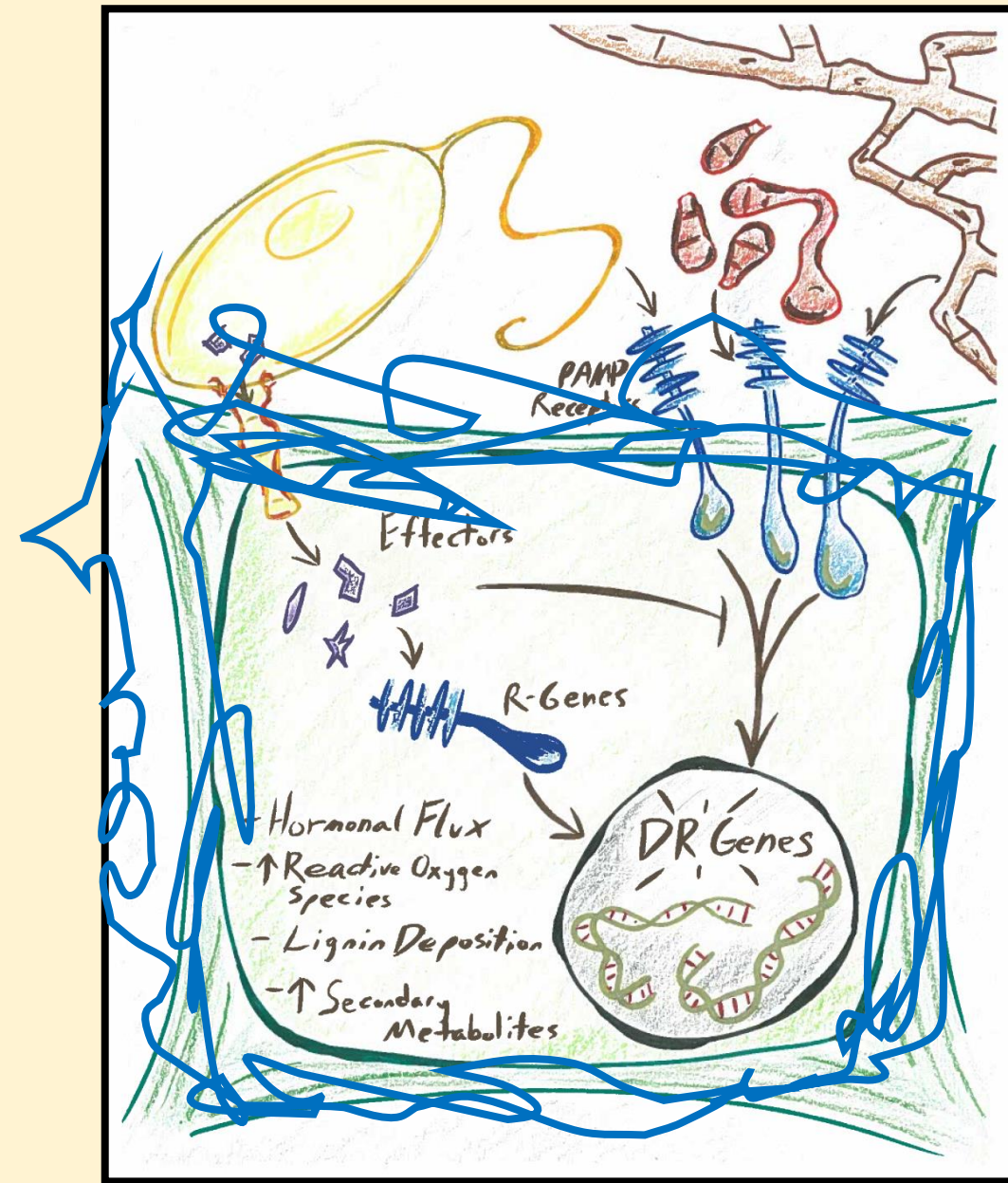
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## 2. Organic fungicides



“Facilitate Regulatory Approval of Sustainable Pest Management Technology for Specialty Crops and Specialty Uses to Promote Public Wellbeing”

- Established in 1963, due to a lack of financial incentive to expand registration of ag products to specialty crops
- Activities of IR-4
  - Residue, efficacy, proposal submissions to EPA for label expansion, Integrated Solutions projects, assisting with registration of new technologies, facilitating harmonization of global pesticide regulations.

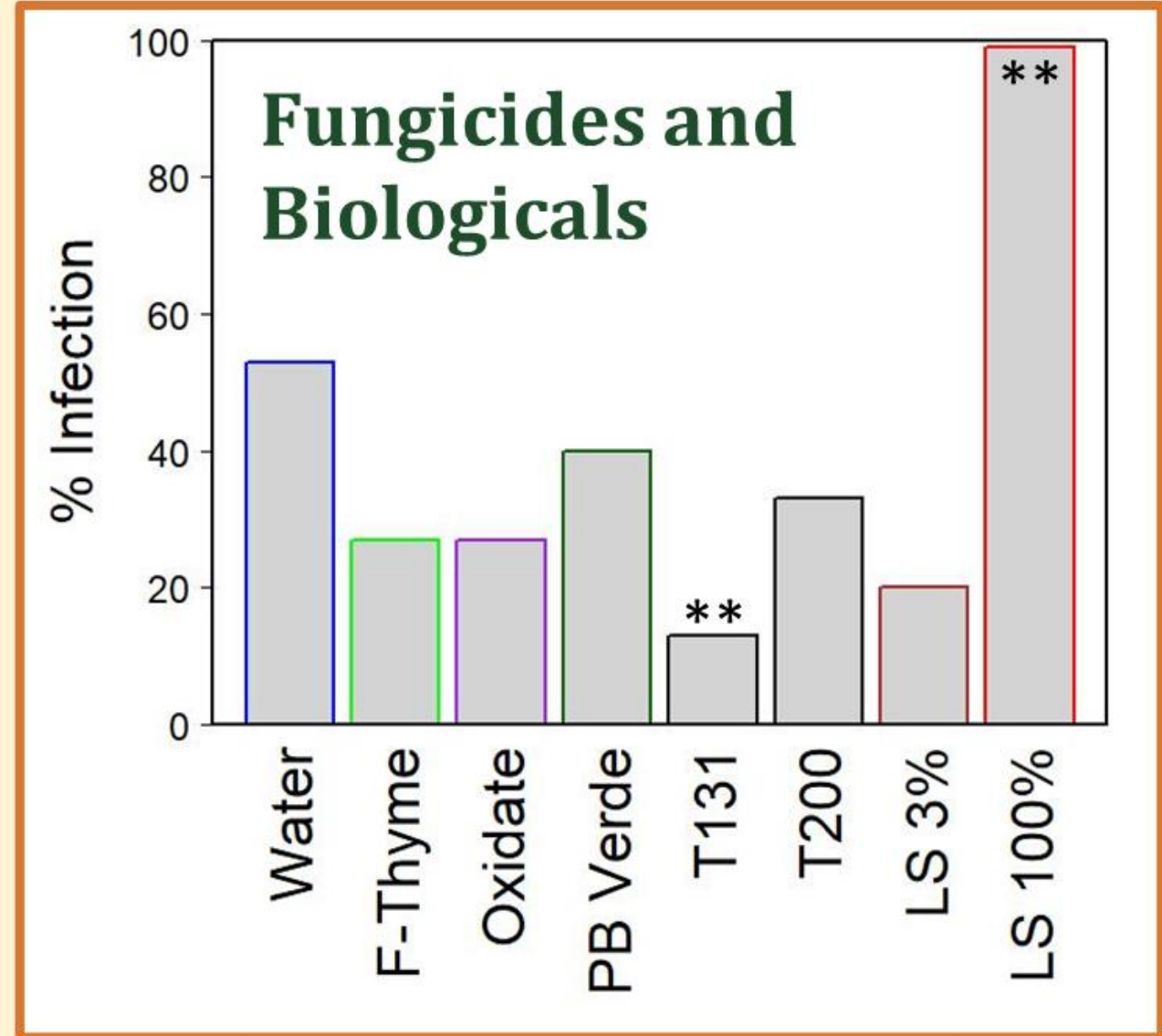
# Fungicides and biologicals show promise

## *Conclusions*

- Trichoderma isolate T131 (from orchards in Western CO), shows antagonism towards *Cytospora*, and prevents infection.

- Organic fungicides all showed reduction!

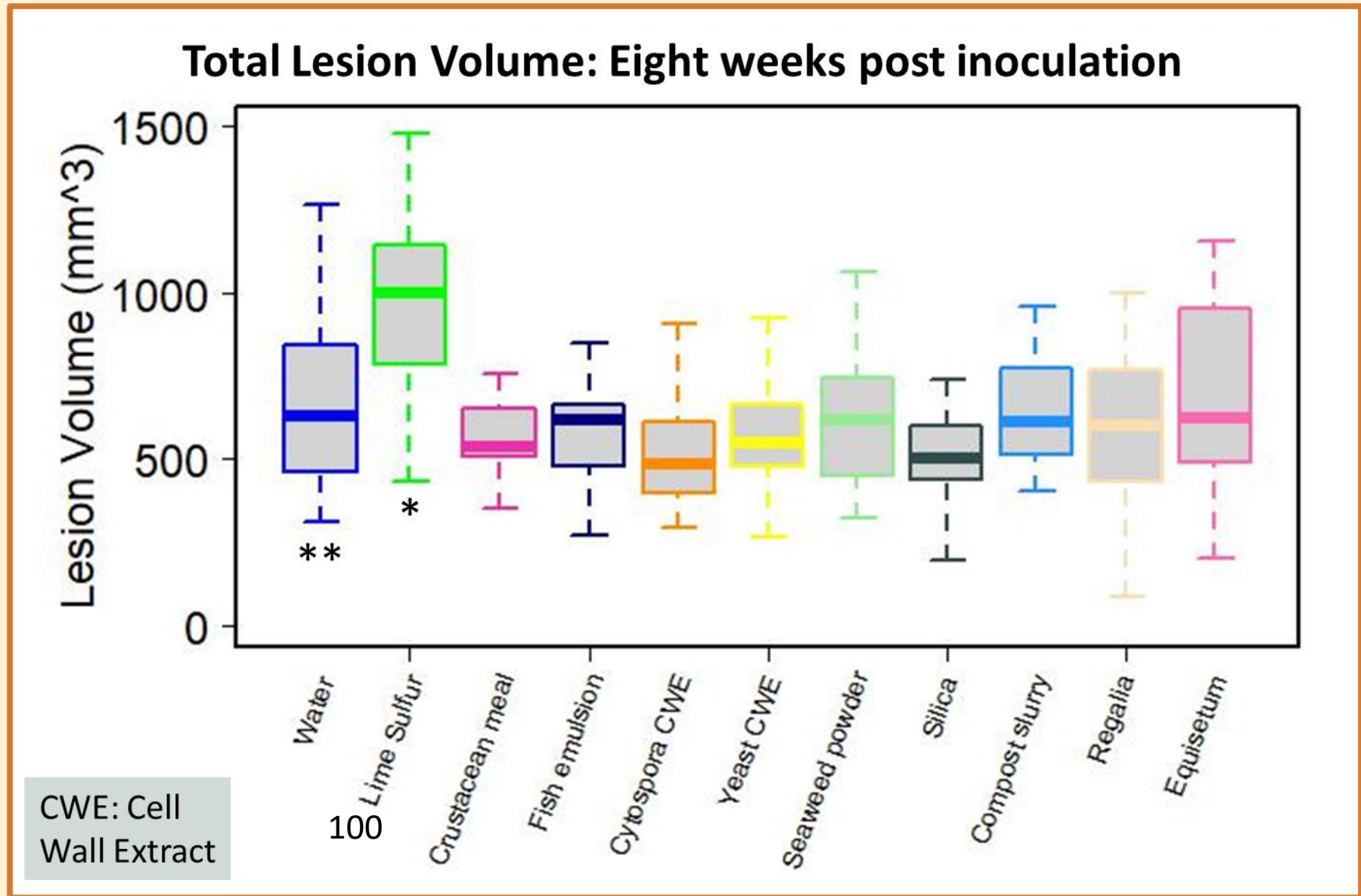
- Lime Sulfur at 100% is *STILL* phytotoxic.



**We've Tried  
it...  
(2022)**

**AND WE'LL TRY  
IT AGAIN!**

With refinement,  
of course.



# March 21<sup>st</sup>

## Peach Pruning and Management!



WESTERN COLORADO RESEARCH  
CENTER – ROGERS MESA  
COLORADO STATE UNIVERSITY

## 2024 WORKSHOP SERIES

**FEB  
15**

### **CROP PLANNING & RECORD KEEPING FOR VEGETABLE FARMS**

Max Kirks, Research Associate, WCRC-  
Rogers Mesa

**FEB  
29**

### **APPLE PRUNING AND MANAGEMENT**

Bryan Braddy, Research Associate, WCRC-  
Rogers Mesa

**MAR  
21**

### **PEACH PRUNING AND MANAGEMENT**

Bryan Braddy, Research Associate, WCRC-  
Rogers Mesa

**APR  
11**

### **WINE GRAPE RESEARCH AT ROGERS MESA- PAST, PRESENT, FUTURE**

Dr. Horst Caspari, State Viticulturist

**MAY  
16**

### **TWO YEARS OF REGIONALLY- ADAPTED SEED VARIETY TRIALS**

Dr. Brad Tonnessen, Scientist, WCRC-  
Rogers Mesa

**JUN  
27**

### **WEED MANAGEMENT ON THE VEGETABLE FARM**

Dr. Brad Tonnessen & Max Kirks, WCRC-  
Rogers Mesa w/ Delta Conservation District

**JUL  
11**

### **VEGETABLE PREDATORS AND POLLINATORS**

Melissa Schreiner, Entomology Specialist,  
CSU Extension

**AUG  
22**

### **3RD ANNUAL WCRC-ROGERS MESA FIELD DAY**

Community event featuring information  
booths, food, games, and more!

**OCT  
24**

### **APPLE AND PEACH ROOTSTOCK TRIAL ANNUAL UPDATE**

Dr. Brad Tonnessen, WCRC-Rogers Mesa



We are excited to host seven unique workshops in 2024 that help inform and empower organic growers in Western Colorado. **All events are free and open to the public!** We will be sharing additional information for each workshop a few weeks before the date listed. While walk-ins are welcome, we request that you register via our Eventbrite (QR code below).



#### Questions or concerns?

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# Thank you

Do you practice integrating livestock  
in your specialty crop operation??

We need to hear from you!

Go to the CSU table and sign up!



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