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LODI WINEGRAPE COMMISSION  
lodigrowers.com

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# Controlling Mealybug in Grapevines



# WHY YOU SHOULD PAY ATTENTION:



It only takes one.

Before last fall, I knew absolutely nothing about mealybugs and didn't care to.

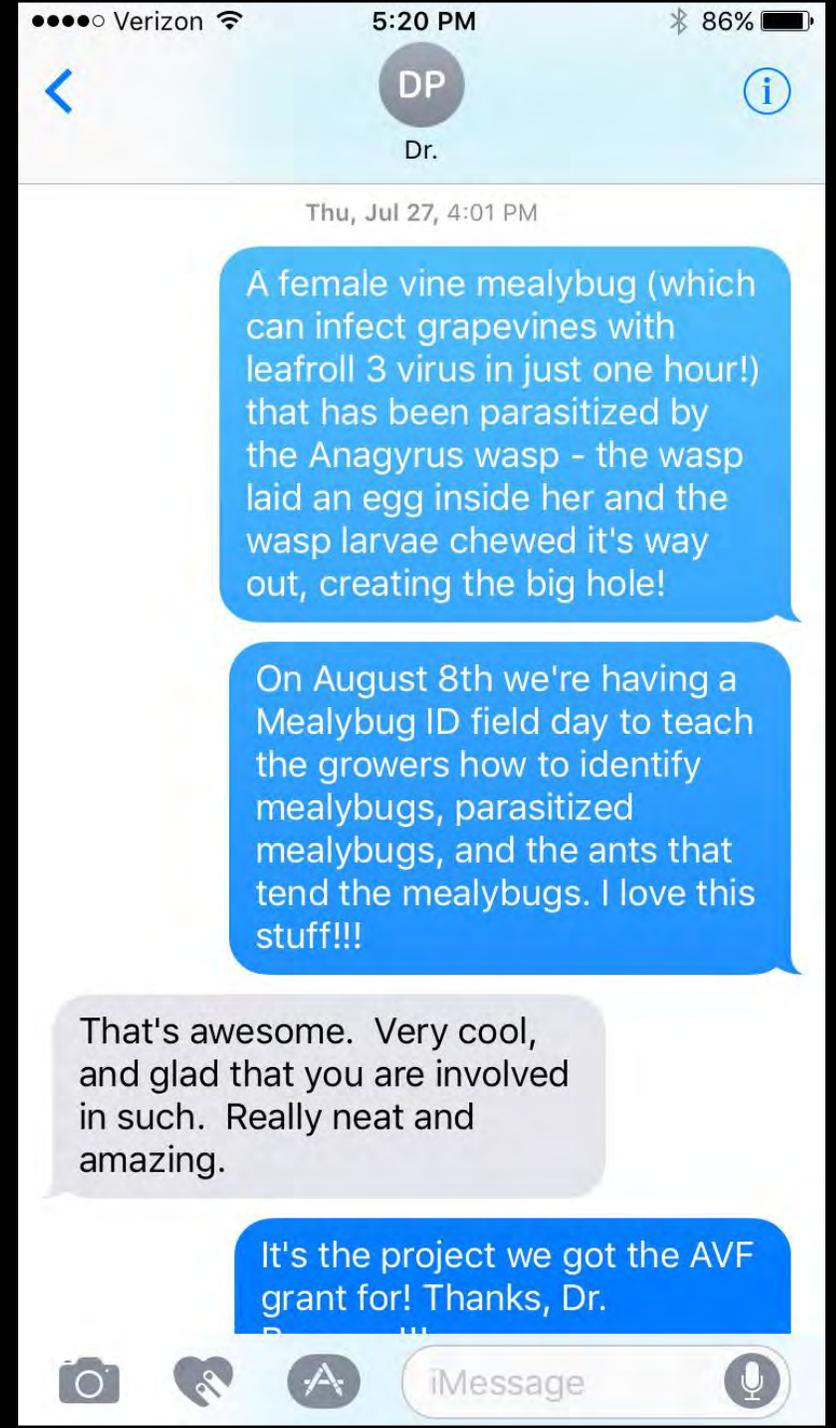


I'm not even sure what a mealybug is exactly.

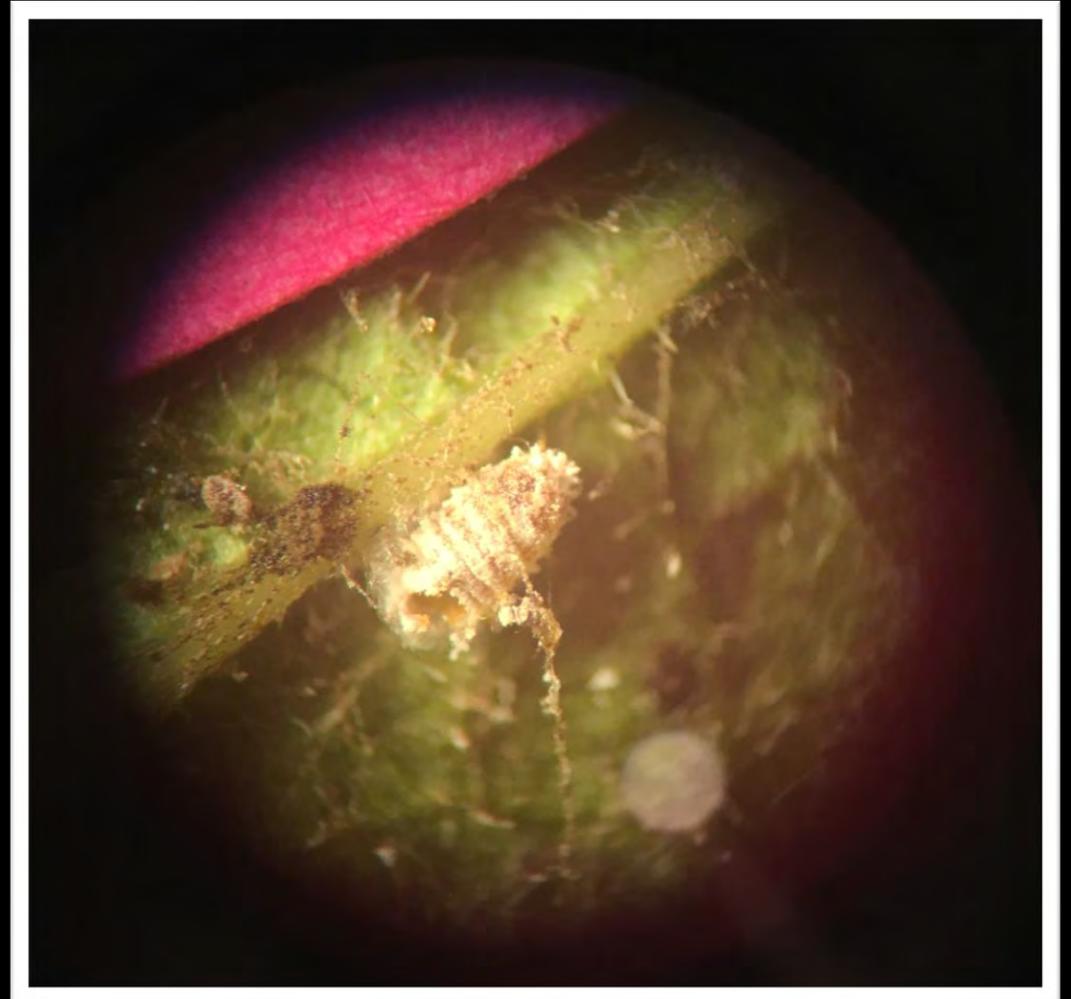
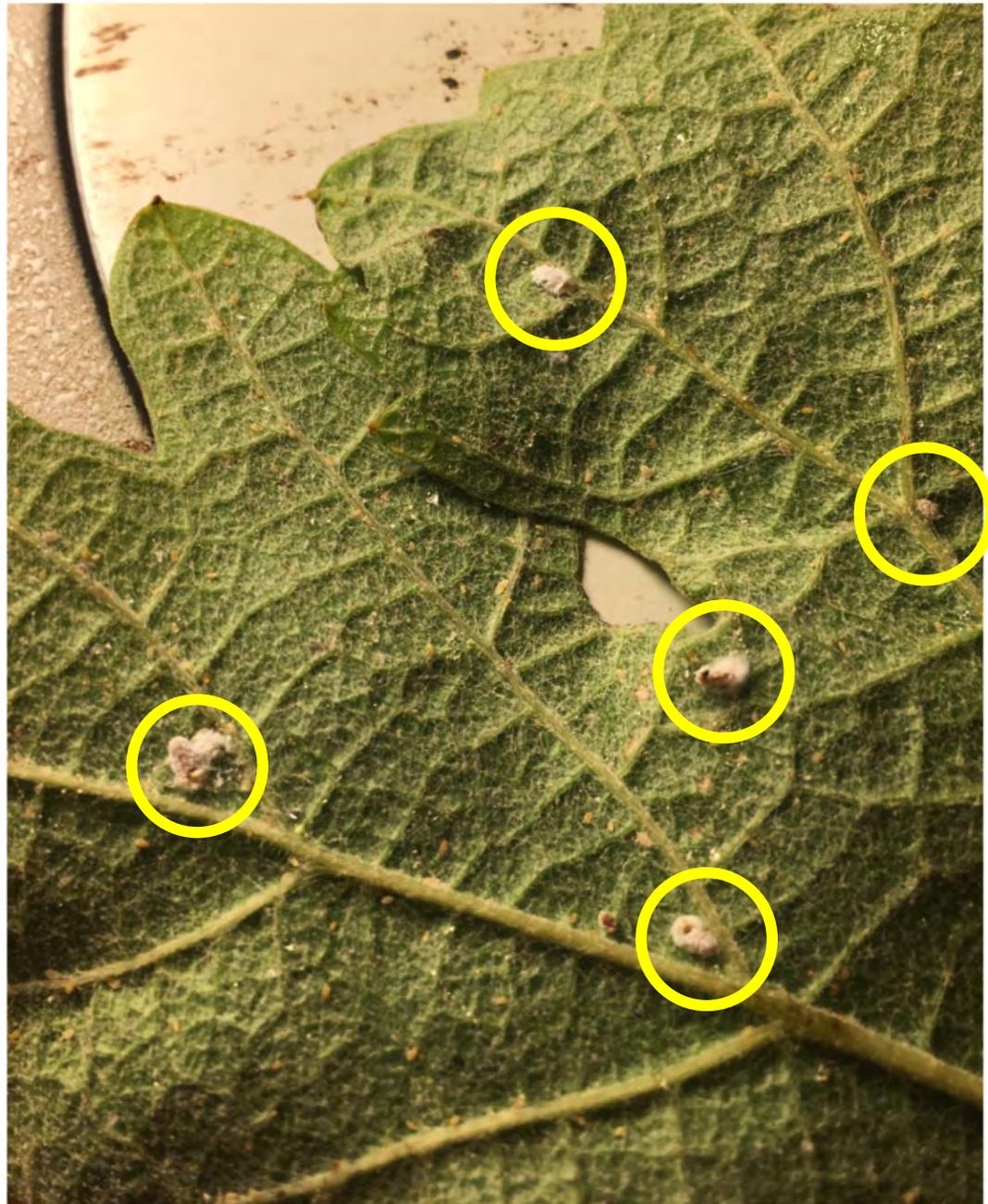


The Lodi growers kept talking about mealybugs, and some really smart people showed me how to search a vineyard for parasitized mealybugs. It was fun.

Now I am texting every person I know with the slightest interest in science about parasitized mealybugs.



1. Look for ants and/or wet trunks.
2. Look underneath the leaves.





### Biological control of mealybugs - Anagyrus pseudococci

3,509 views

18 0 SHARE



**Koppert Biological Systems**

Published on Aug 22, 2016

**SUBSCRIBE 3.7K**

This parasitic wasp is well-known for its use in the biological control of mealybugs. Anagyrus parasitizes different stages of mealybugs. The wasp actively searches for its prey. Anagyrus stings the mealybug with its ovipositor to paralyze it. Then it injects an egg, which will develop inside the

[SHOW MORE](#)



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YouTube: *Anagyrus* wasp parasitizes a mealybug.

# LODI MEALYBUG BIOCONTROL RESEARCH FOCUS GROUP, *est.* 2017



REAL WORLD GROWERS + SCIENTISTS + ADVISORS = OUTREACH

1

VMB/HR

300

EGGS

5-7

STAGES

5-8

GENS

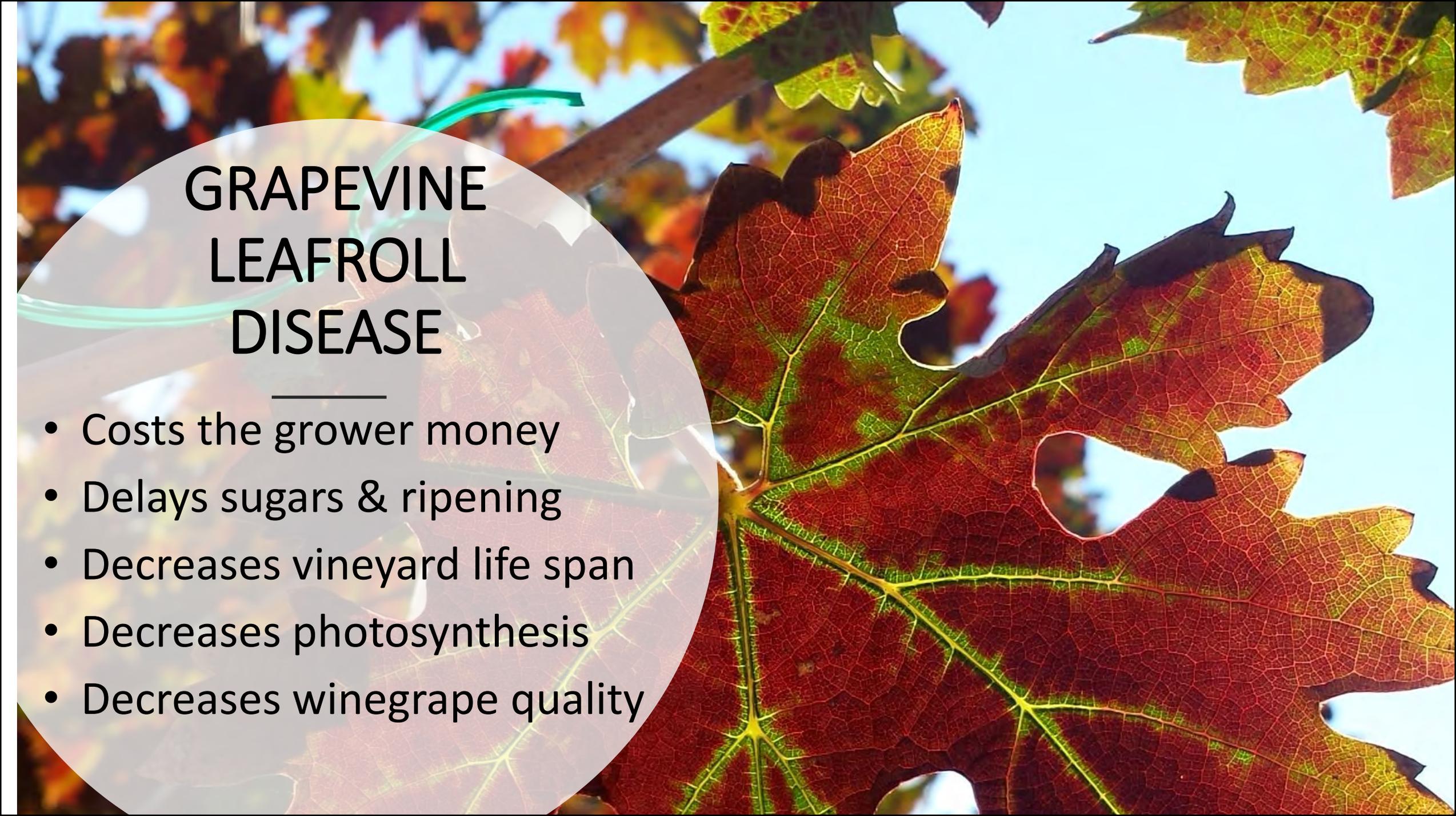
30

CM

1994

CALI





# GRAPEVINE LEAFROLL DISEASE

- Costs the grower money
- Delays sugars & ripening
- Decreases vineyard life span
- Decreases photosynthesis
- Decreases winegrape quality

1

VMB/HR

300

EGGS

5-7

STAGES

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1  
VMB/HR

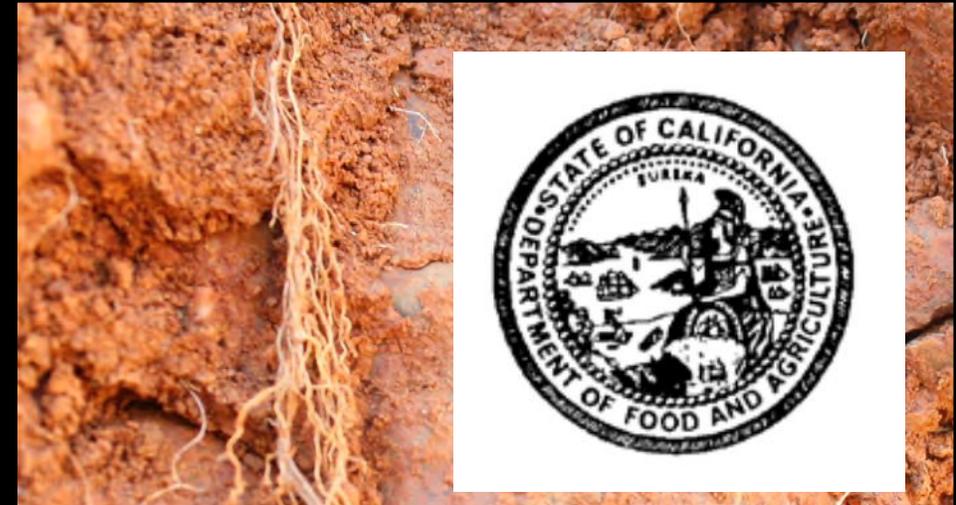
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## Grapevine Disease Testing Protocol 2010

by Dr. Adib Rowhani and Dr. Deborah Golino, Foundation Plant Services and Department of Plant Pathology, University of California, Davis



1

VMB/HR

300

EGGS

5-7

STAGES

5-8

GENS

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CM

1994

CALI

# Wanted: Vine Mealybug

## Se Busca: El Piojo Harinoso de la Vid

The Vine Mealybug is a serious new insect pest for California vineyards; it is important to locate any new infestations as soon as possible. All field workers need to learn how to recognize this pest; if you find insects that look like the Vine Mealybug, notify your supervisor immediately.

El Piojo Harinoso de la Vid es una nueva y seria amenaza para los viñedos en California; es importante encontrar lo más pronto posible cualquier infestación nueva. Todos los trabajadores del campo necesitan aprender a identificar este insecto; si lo encuentran avisen inmediatamente a su jefe.

### Other mealybugs

Other less-harmful mealybugs are often found in vineyards. These all have obvious 'tails'; the Vine Mealybug does not have these tails.

### Otros piojos harinosos

Hay otros tipos de piojos harinosos menos dañinos en los viñedos. Estos otros tipos siempre tienen obvias colitas; el Piojo Harinoso de la Vid no tiene estas colitas.



Tails Colitas

Other mealybugs  
Otros piojos harinosos



Tails Colitas

Other mealybugs  
Otros piojos harinosos

Vine Mealybug  
Piojo Harinoso de la Vid



The adult insect is about 3 mm long; it is often tended by ants

El insecto adulto mide alrededor de 3 mm; se encuentra asociado con hormigas



Black sooty leaves

Hojas negras

Many insects on the trunk

Muchos insectos sobre el

Vine Mealybug  
Piojo Harinoso de la Vid



The Vine mealybug feeds on the entire vine, including the roots. Above it is shown feeding underneath thick layers of bark on the trunk.

El Piojo Harinoso de la Vid habita todas las partes de la planta, incluyendo las raíces. Arriba se lo ve alimentándose debajo de la corteza.

# HOW TO BE SMART ABOUT MEALYBUGS

1

**STEP ONE.**  
**Educate**  
**yourself and**  
**your crews.**



Google: biokids vine mealybug

## Lodi Looks at Biocontrol for Vine Mealybug

by Ted Rieger



Pest Control Advisor Larry Whitted (right) and organic grower Jay Leone examine a grapevine leaf for parasitized mealybugs in Leone's Lodi vineyard during the Lodi Winegrape Commission's mealybug biocontrol field day.

Lodi, Calif.—Management of vine mealybug (VMB) in California vineyards has been problematic because of this pest's high reproduction potential with multiple generations and a year-round presence with life stages that overwinter under vine bark, where it is difficult to apply treatments.

The vine mealybug (VMB) causes damage by feeding on grape clusters and vine parts where it produces honeydew that provides a medium for mold growth and makes grapes unmarketable. In addition, the VMB is a vector of grapevine leafroll-associated viruses.

The Lodi Winegrape Commission's (LWC) recently formed the Mealybug Biocontrol Research Focus Group, which held a field day Aug. 8 to educate growers in field identification and management of the VMB, and the identification of parasitized mealybugs and insects that are effective mealybug predators. LWC research and education director Dr. Stephanie Bolton coordinates the focus group's activities as the principal investigator for a two-year project funded by the American Vineyard Foundation. "A primary objective for the research focus group is to educate growers on what we can do to integrate more biocontrol into our normal integrated pest management (IPM) programs and spraying activities," Bolton said.

# HOW TO BE SMART ABOUT MEALYBUGS

*Cryptolaemus*  
beetle (adult)



*Cryptolaemus*  
beetle (larvae)

2

**STEP TWO.**  
Keep your good  
bugs alive.

*Anagyrus* wasp



## AN IMPORTANT FIRST STEP IN BIOCONTROL: DON'T KILL THE GOOD INSECTS!

Your CD11 Mealybug Biocontrol Research Focus Group has put together this regionally-specific chart, based on the UC-IPM Relative Toxicities of Insecticides and Miticides Used in Grapes to Natural Enemies and Honey Bees Table, available online at [ipm.ucanr.edu/PMG/r302900111.html](http://ipm.ucanr.edu/PMG/r302900111.html), and years of real-world experience.



Help the good insects (beneficials, predators, parasites) help you!  
What GOOD insects are we trying to keep ALIVE, anyways?

The *Anagyrus* wasps, *Cryptolaemus* beetles, and Lacewings who attack mealybugs.

The predatory mites, six-spotted thrips, and minute pirate bugs who attack mites.

The *Anagrus* wasps and green lacewings who attack leafhoppers.

The parasitic wasps and flies who attack caterpillars and omnivorous leafrollers.



# Good insects delay pesticide resistance.

Trade Name	Common name	MOA	Good insects stay alive	May reduce good insects	Good insects are killed
Acramite	bifenazate	20D			
Admire Pro (soil)	imidacloprid	4A			
Altacor	chlorantraniliprole	28			
Altrevin	metaflumizone bait	22B			
Apollo	clofentezine	10A			
Boric Acid	disodium tetraborate	unknown			

LODI WINEGRAPE

Trade Name	Common name	MOA	Good insects stay alive	May reduce good insects	Good insects are killed	Notes
Danitol	fenpropathin	3A				broad spectrum toxicity to beneficial insects and predatory mites
Delegate	spinetoram	5				moderate toxicity to beneficial predators and parasites
Fujimite	fenpyroximate	21A				high toxicity to predatory mites
Imidan	phosmet	1B				high toxicity to beneficial insects
Lorsban Advanced	chlorpyrifos	1B				high toxicity to beneficial insects
Malathion	malathion	1B				high toxicity to beneficial insects
Pyganic	pyrethrin	3A				moderate toxicity to beneficial predators and parasites
Pyrenone	pyrethrin/piperonyl butoxide	3A				high toxicity to beneficial insects
Sevin	carbaryl	1A				moderate toxicity to beneficial predators and parasites

For the "May reduce good insects" category, you may wish to seek further advice from your local Farm Advisor because the risk to beneficials can be dependent on application, timing, and cover crop use. Remember to rotate chemistries and follow label application instructions carefully to delay resistance development. Using **beneficial insects** for **biocontrol** of other insects/mites is an **IMPORTANT** part of **resistance management** in your vineyard.

Please share your personal vineyard experiences with different plant protectants and their effect on beneficial insects! [stephanie@lodiwine.com](mailto:stephanie@lodiwine.com)

# I brought you a copy. You're welcome.

# HOW TO BE SMART ABOUT MEALYBUGS



During prohibition, grape farmers would make semi-solid grape concentrates called wine bricks, which were then sold with the warning "*After dissolving the brick in a gallon of water, do not place the liquid in a jug away in the cupboard for twenty days, because then it would turn into wine*"

3

**STEP THREE.**  
Control the  
ants.



**AFTER MIXING WITH  
ANT BAIT, DO NOT  
APPLY TO YOUR  
VINEYARD FOR  
EFFECTIVE ANT  
CONTROL**

# HOW TO BE SMART ABOUT MEALYBUGS



4

**STEP FOUR.**  
**Don't spread**  
**mealybugs with**  
**equipment.**

# HOW TO BE SMART ABOUT MEALYBUGS

1

**STEP ONE.**  
Educate  
yourself and  
your crews.

2

**STEP TWO.**  
Keep your good  
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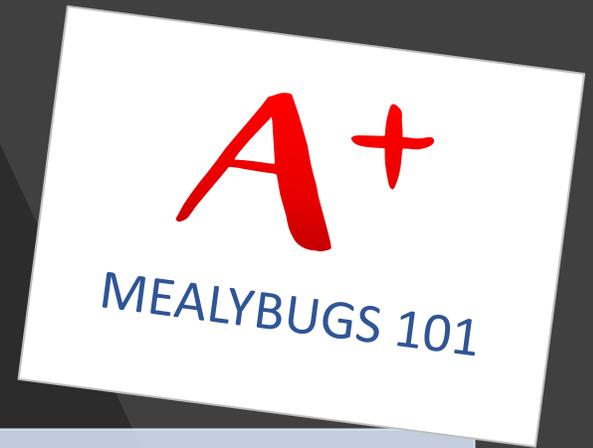
3

**STEP THREE.**  
Control the  
ants.

4

**STEP FOUR.**  
Don't spread  
mealybugs with  
equipment.

# HOW TO BE REALLY REALLY SMART ABOUT MEALYBUGS



5

**STEP FIVE.**  
Trap for mealybugs.



6

**STEP SIX.**  
Use mating disruption.



7

**STEP SEVEN.**  
Keep application & effect records.

8

**STEP EIGHT.**  
Host a neighborhood work group.



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Handouts

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THE WINES OF  
LODI CALIFORNIA

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Videos, Presentations, & Handouts

TREE & VINE EXPO – Mealybug Management Presentation – November 7th, 2017

- Stephanie Bolton's presentation will be available [HERE](#)
- Mealybug biocontrol pesticide risk table is available [HERE](#)
- YouTube Video by [Kopper](#) of a *Cryptolaemus* beetle eating mealybug – click [HERE](#)
- YouTube Video by [Kopper](#) of an *Anagyrus* wasp laying an egg in a mealybug – click [HERE](#)

LODI Vineyard Cost Study Customization Workshop – November 2nd, 2017

- Meeting agenda/main handout, including perhaps the most comprehensive list of vineyard budget inputs, available [HERE](#)
- Simple vineyard budget Excel file example available [HERE](#)
- Vineyard Operation breakdown of costs Excel file example available [HERE](#)
- Banker presentation available [HERE](#)
- Tips from the meeting:
  - use the Cost Study and the meeting handout as a starting point to create an Excel file which will calculate costs per acre and per ton
  - remember that there are "hidden" costs which go into farming – such as the value of your land and your time
  - watch your true profit margin to determine if your current farming operation is working for you
  - knowing the details for certain vineyard practices – irrigation, for example – helps you figure out ways to improve efficiency and save money
  - track your costs and profits for each vineyard block over time (5 years, 10 years, and the vineyard's lifetime)
  - daily record keeping is a must and will help you feel more confident in your finances and in future purchases
  - it's never too late to start a better budget – for more information on FREE Farmer Excel classes, call the Library at 209.333.5554

NRCS EQIP and R&D Tax Credits Workshop – October 24th, 2017

- Meeting agenda is available [HERE](#)
- NRCS EQIP presentation by Ora Van Steyn and Perla Alonso (NRCS – Stockton) is available [HERE](#)
- Cover Crop and Soil Management presentation by Karen Lowell (NRCS Agronomist) is available [HERE](#)
- R&D Tax Credits presentation by Ray Esquivel (Moss Adams) is available [HERE](#)

**EVENTS CALENDAR**

- [LWC & Lodi Public Library: YouTube & Podcasts](#)  
November 6 @ 9:00 am - 12:00 pm
- [LODI RULES COMM. MEETING](#)  
November 6 @ 12:00 pm - 2:00 pm

[View All Events](#)

Lodi Weather

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Lodi Winegrowers  
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NEW on the #LODI GROWERS #BLOG:  
BARN OWL BOX MAINTENANCE



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