Stephanie Bolton, PhD
Grower Research & Education Director
LODI WINEGRAPE COMMISSION
lodigrowers.com

Controlling Mealybug in Grapevines

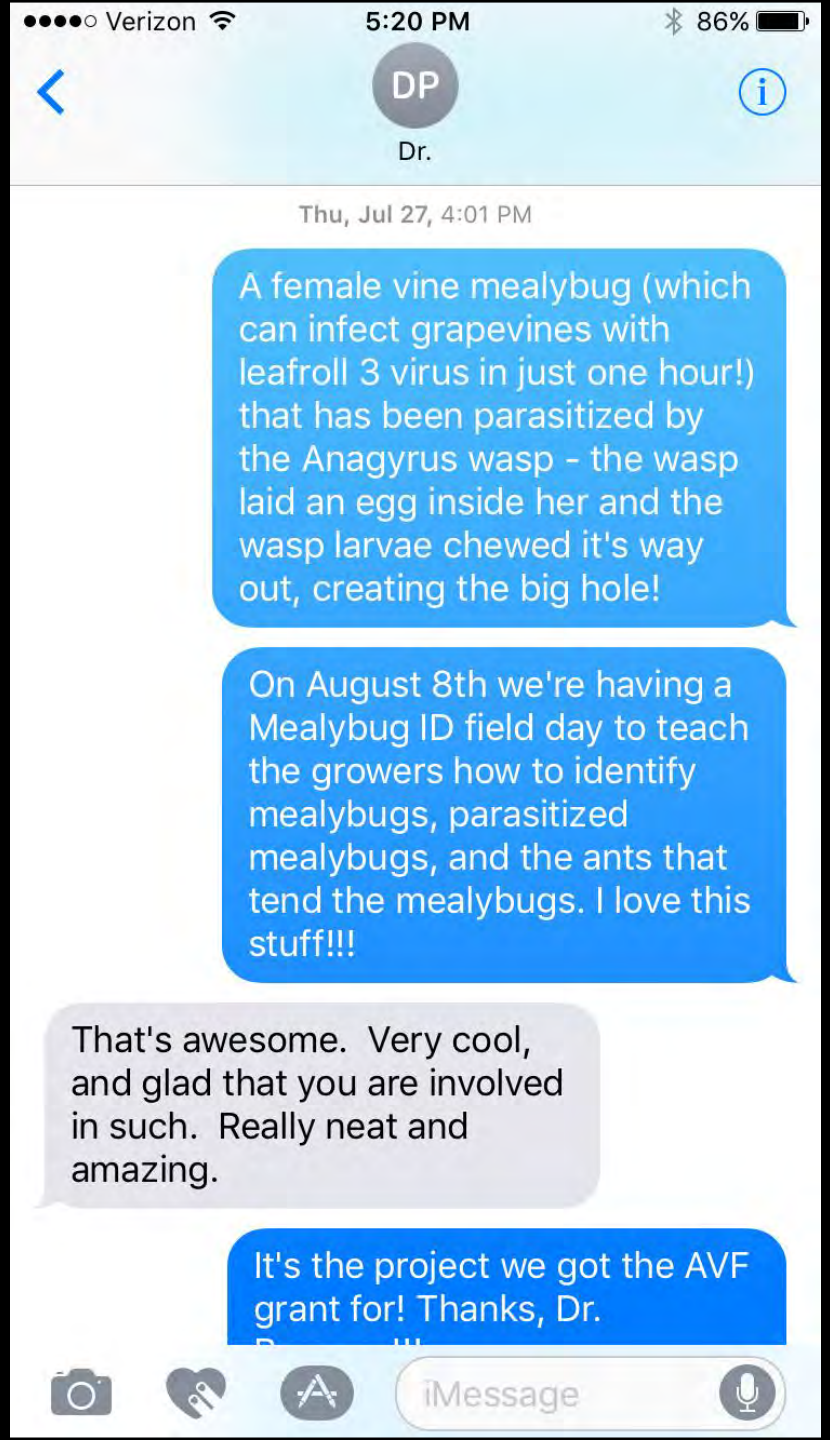
WHY YOU SHOULD PAY ATTENTION:

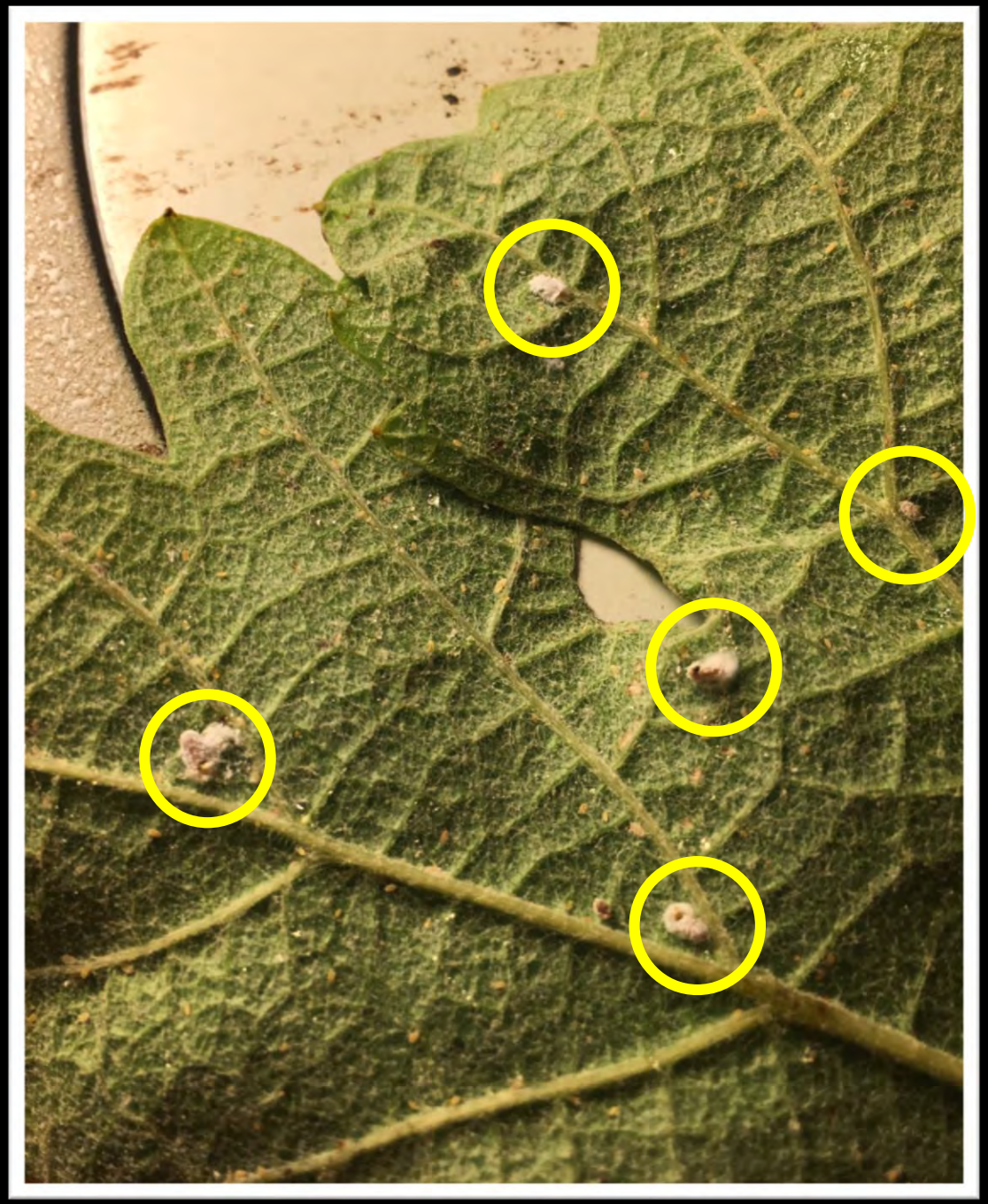
It only takes one.

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

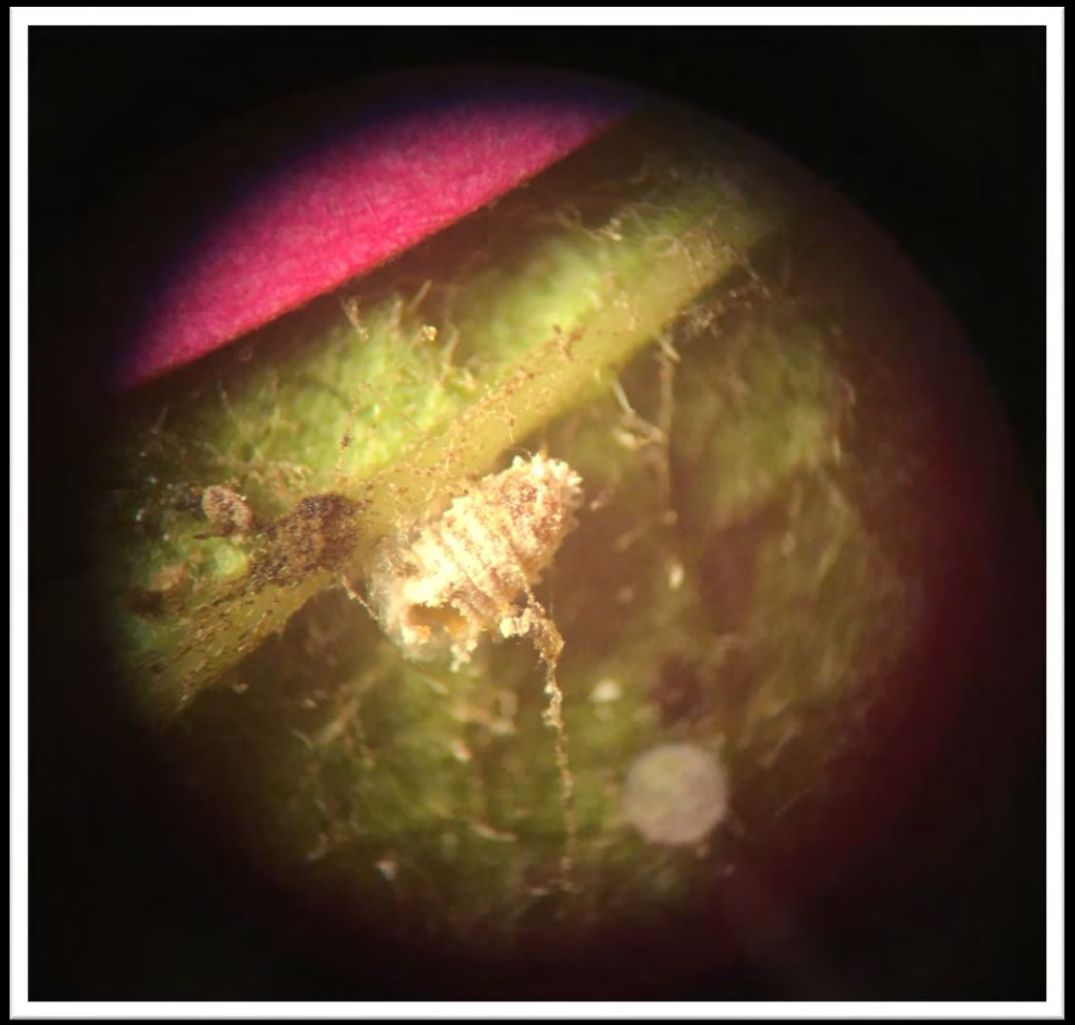
The Lodi growers kept talking about mealybugs, and some really smart people showed me how to search a vineyard for parasitized mealybugs. It was fun.

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

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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

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SHOW MORE

YouTube: *Anagyrus* wasp parasitizes a mealybug.

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






REAL WORLD GROWERS + SCIENTISTS + ADVISORS = OUTREACH

1
VMB/HR

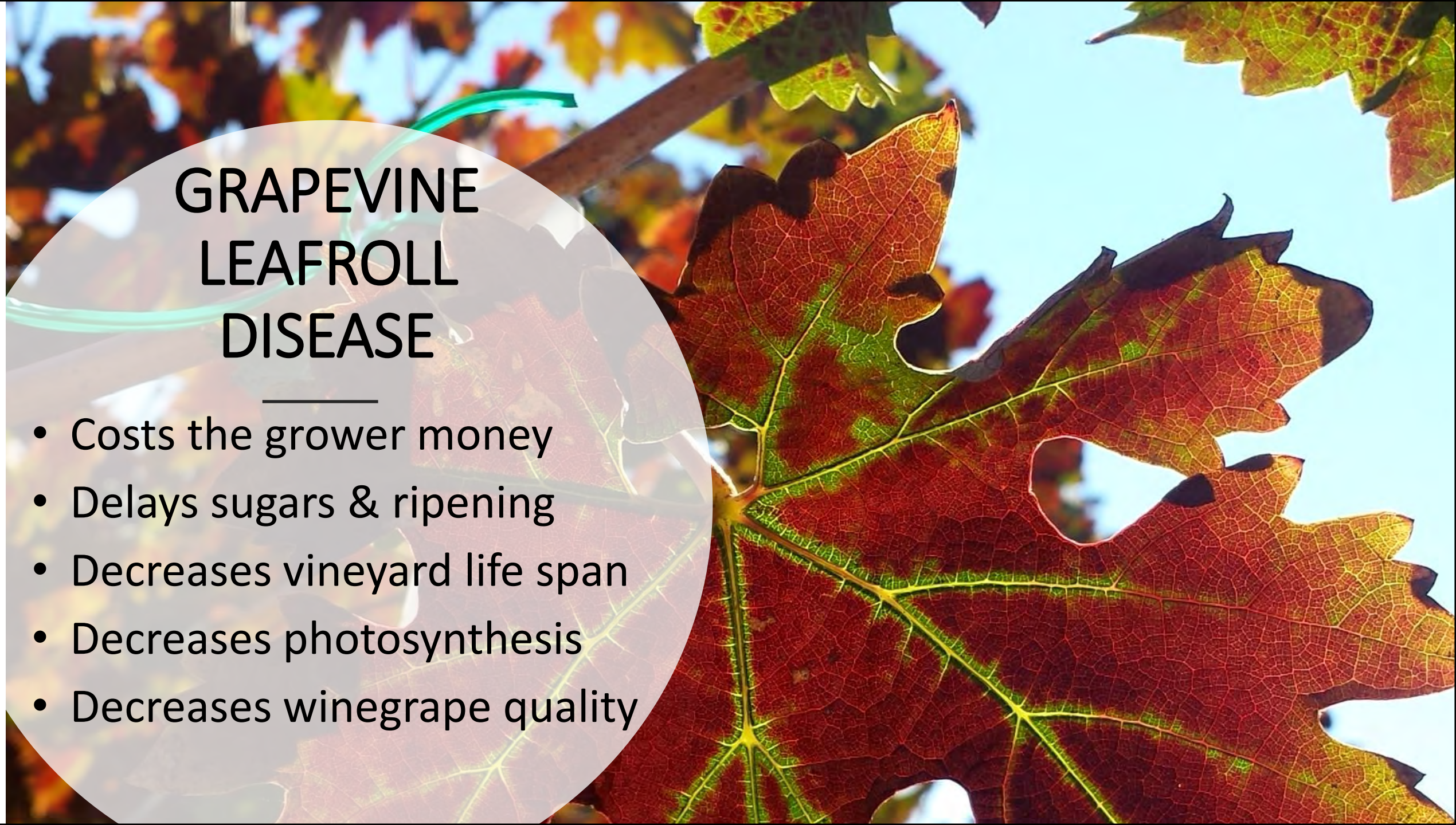
300
EGGS

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

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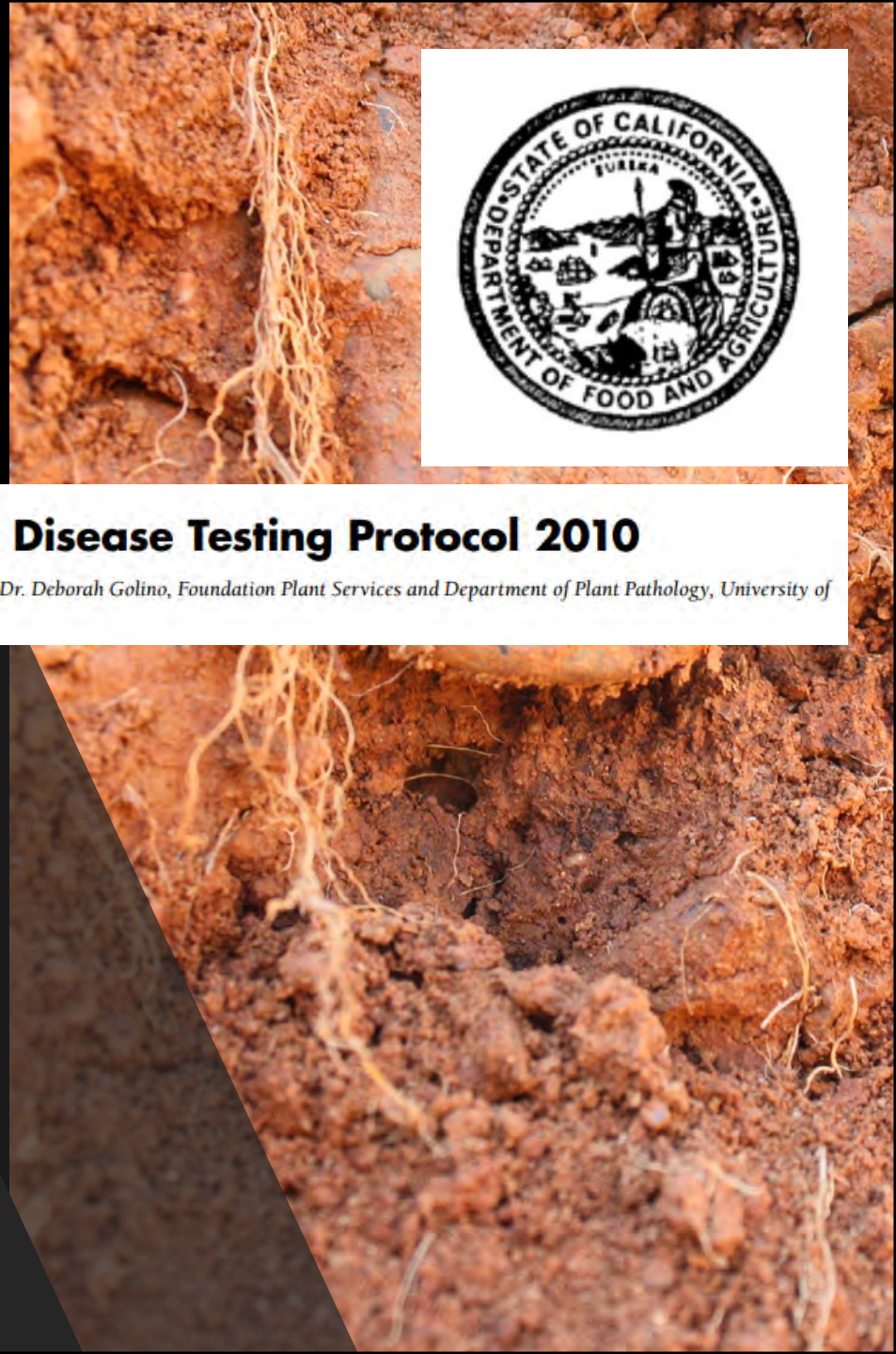

Grapevine Disease Testing Protocol 2010

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

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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.

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

October 2017 Issue of *Wines & Vines*

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**

Good insects delay pesticide resistance.

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, 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.

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

LODI WINEGRAP

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

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 <u>NOT</u> 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 bugs alive.

3

STEP THREE.
Control the ants.

4

STEP FOUR.
Don’t spread mealybugs with equipment.

HOW TO BE REALLY REALLY SMART ABOUT MEALYBUGS

A+

MEALYBUGS 101

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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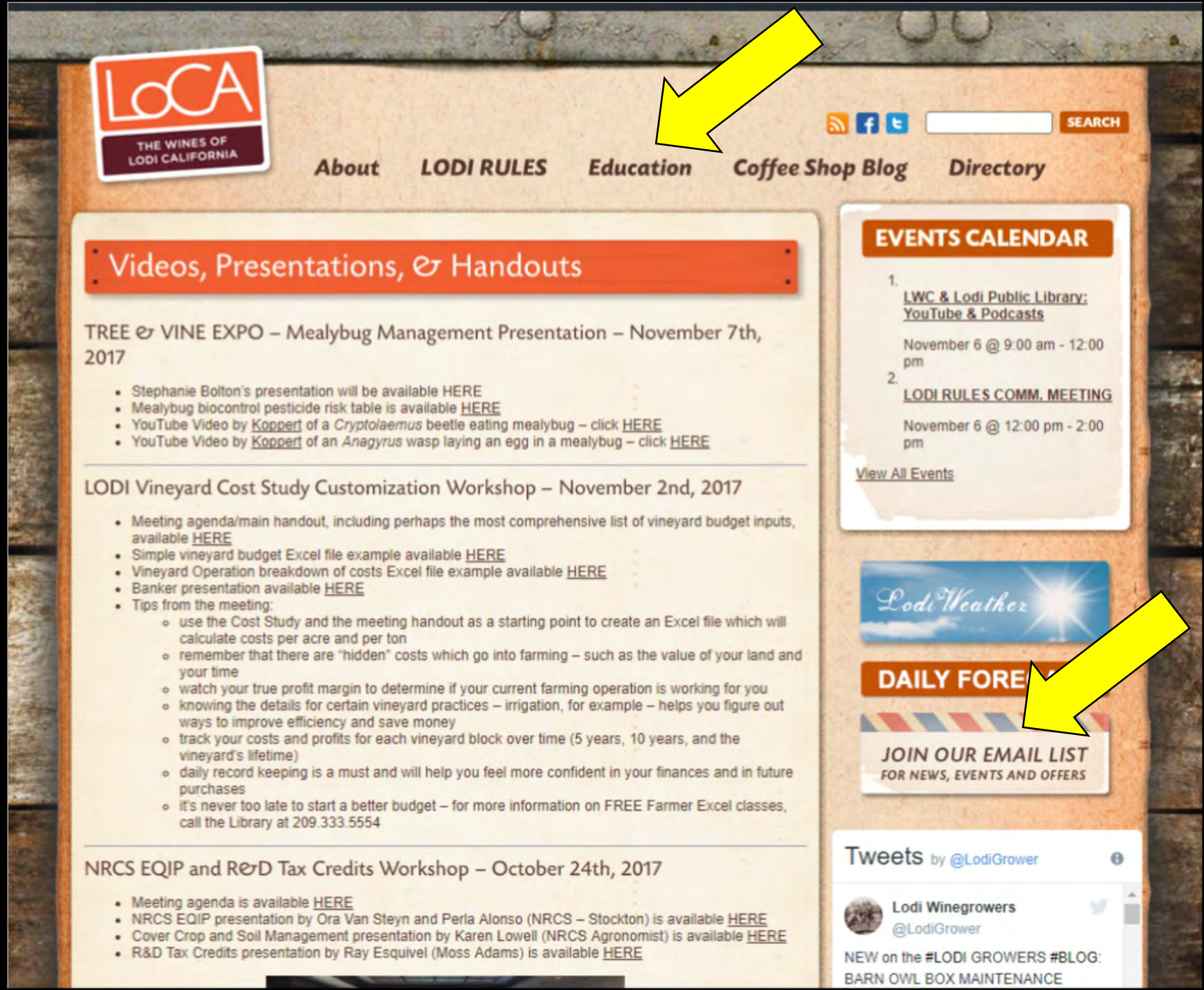
Education

Videos, Presentations, & Handouts

Local Opportunities



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