

What we know about red blotch and leafroll disease incidence in the foothills.

L.R. Wunderlich

Foothill Grape Day May 18, 2016

2011 UCCE Foothill Grape Research Project Summary

Recurrent theme: What's causing the "Red Leaf" phenomenon? *Increasing our knowledge over time*

- **Nutritional deficiencies: can we mitigate symptoms and show petiole uptake with fertilizing?**
 - Understanding foothill soils and potential for nutrient management recommendations based on soil type
- **Leafroll virus: which species are present here?**
 - Mealybugs and other potential leafroll vectors
Phylloxera?
 - Gill's mealybug biology and management

Grapevine Leafroll Associated Virus (GLRaV)

Transmitted also
mechanically (grafting)

Known **vectors**
in foothills



Grape
mealybug

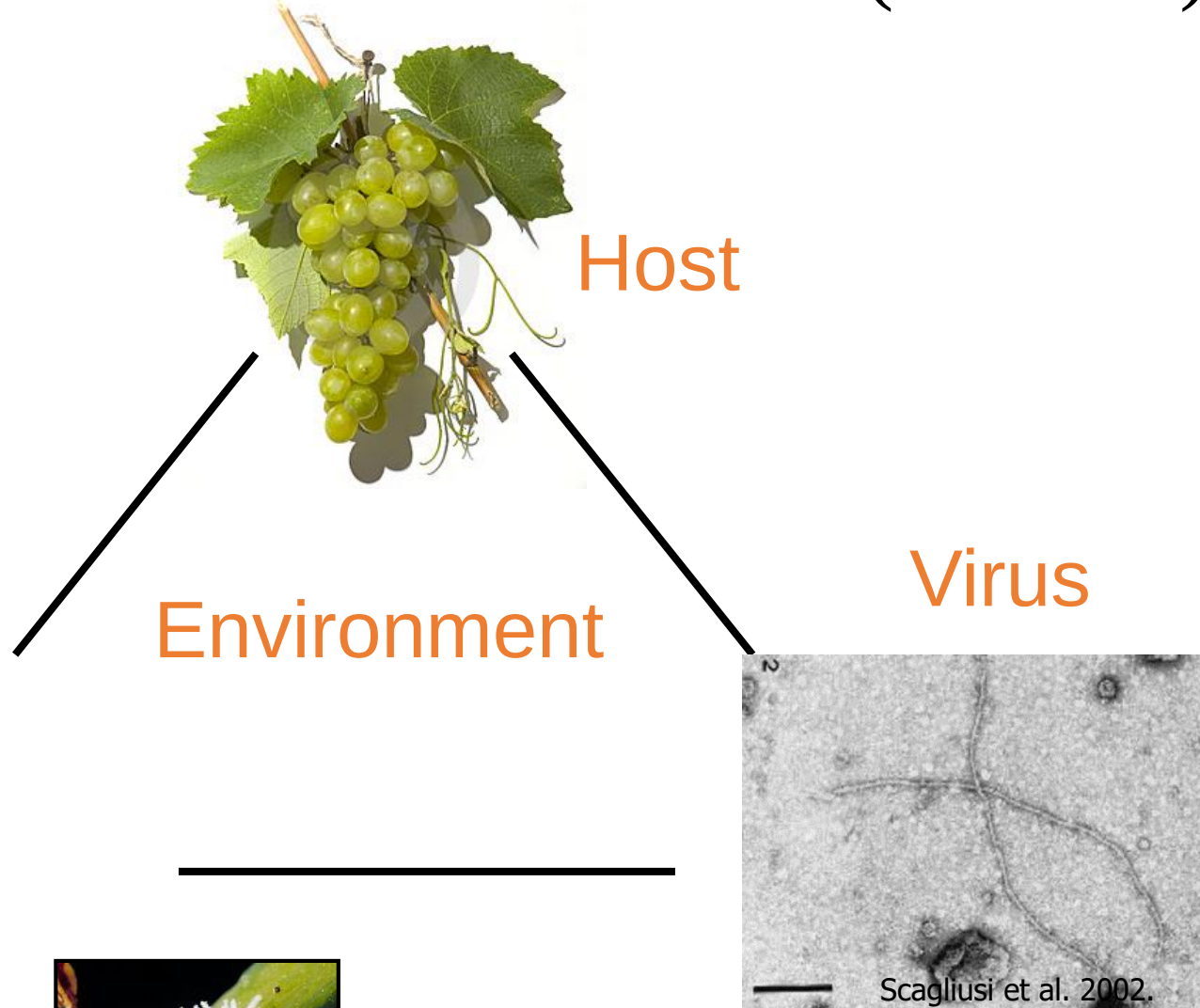


Gill's
mealybug

Others?

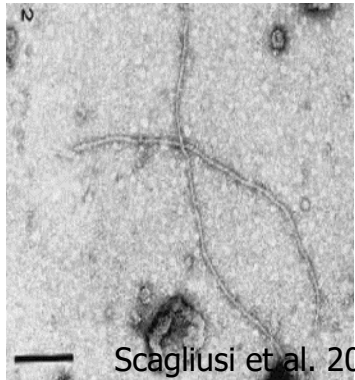


Vine mealybug-
Amador western
edge only (so far).



Grapevine Leafroll Associated Virus (GLRaV)

Virus



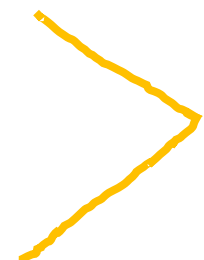
Scagliusi et al. 2002.

Caused by a complex of viruses

GLRaV-1

GLRaV-3

GLRaV-4LV ('like virus')



GLRaV-2: no known vector

GLRaV-7: odd, not believed to be important, no known vector

All leafroll viruses are graft transmitted, can come in on planting material.



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RESEARCH ARTICLE

Relative Prevalence of Grapevine Leafroll-Associated Virus Species in Wine Grape-Growing Regions of California

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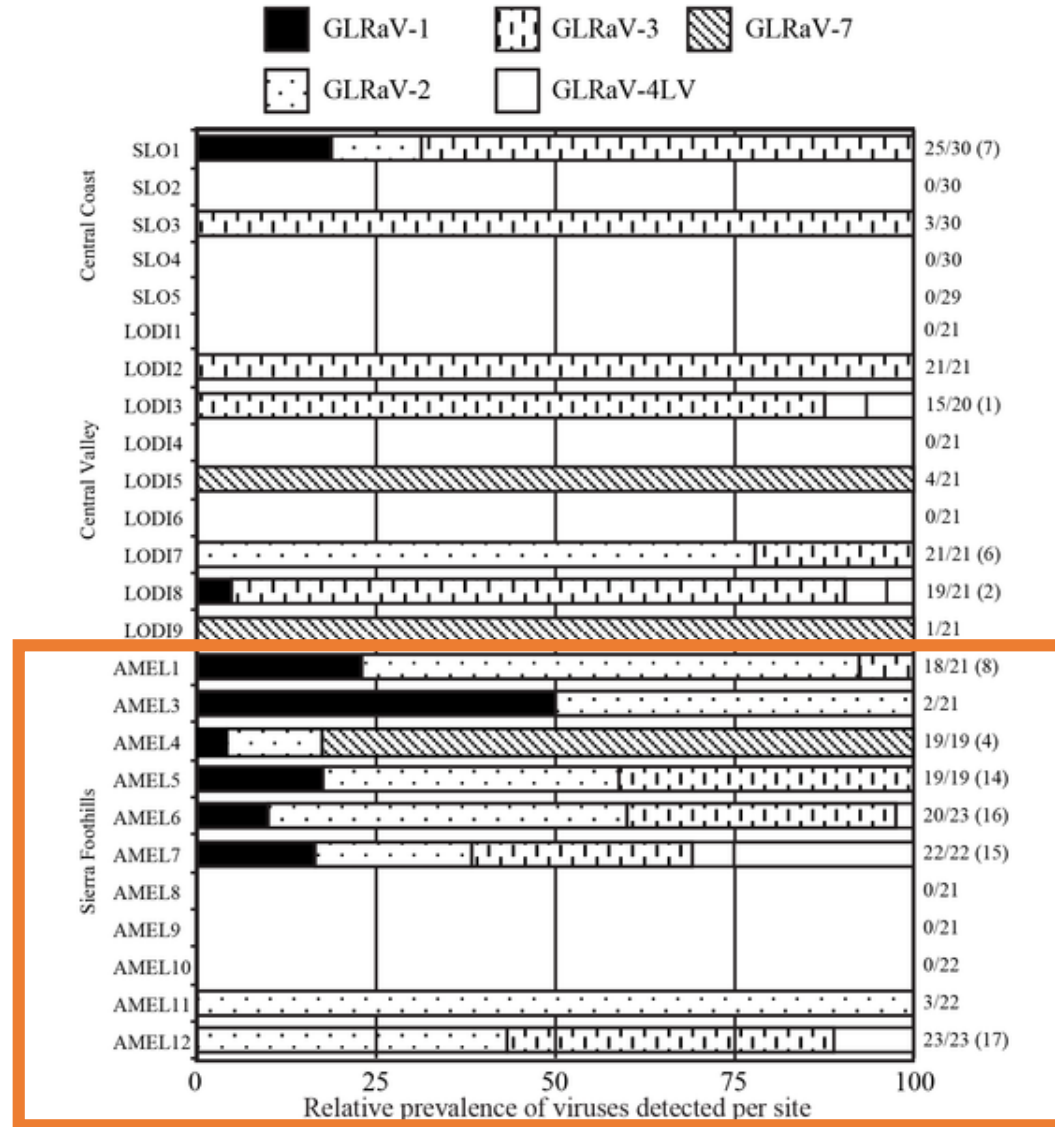


Fig 1. Relative prevalence of grapevine leafroll-associated viruses in tested vineyards.

8/11 AMEL sites tested
positive for at least
one GLRaV

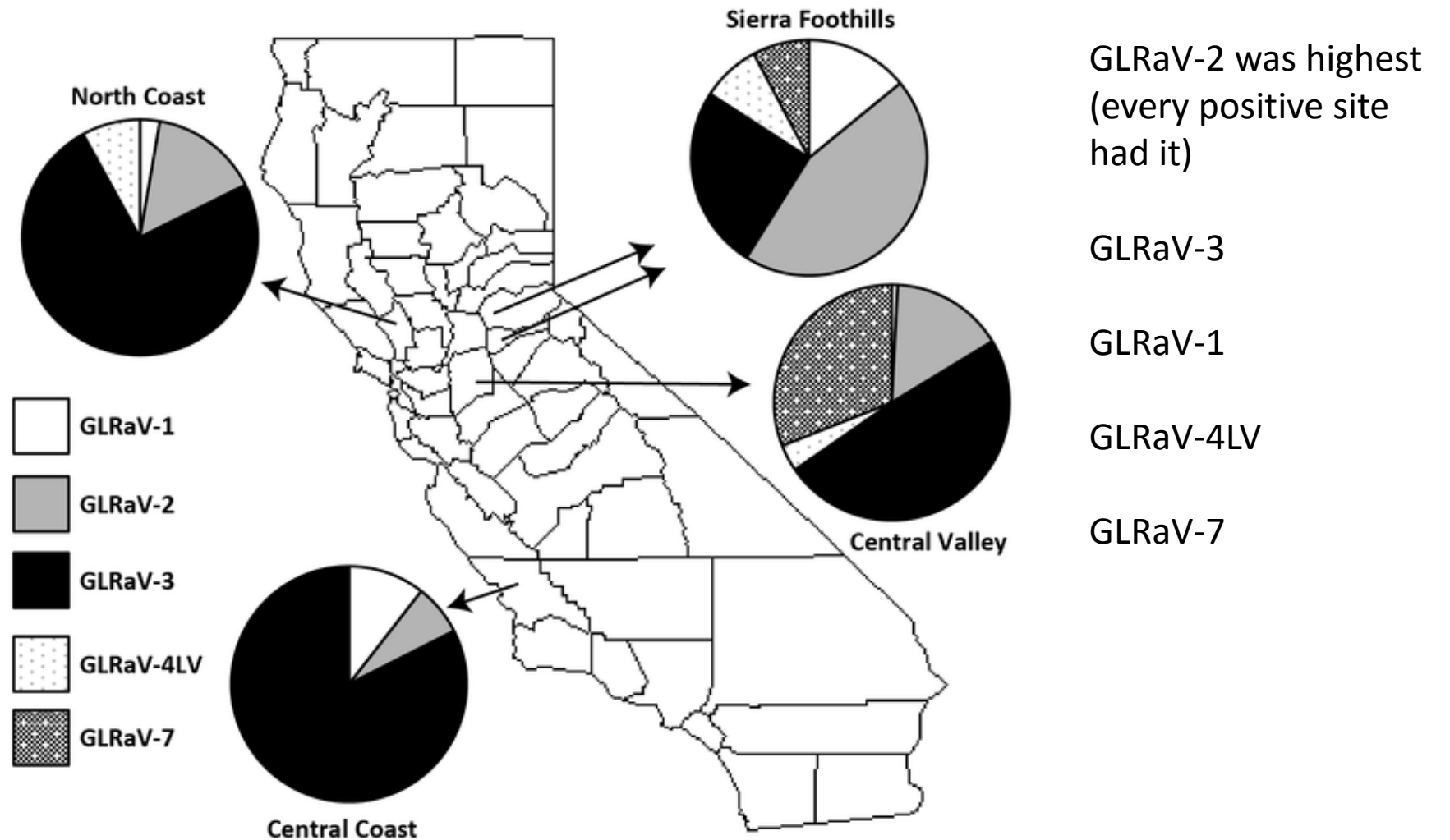
234 samples taken:
47% positive for at
least one GLRaV

GLRaV-2 was most
prevalent (every
positive site had it)



30% of AmEL samples had
mixed infections (more
than one leafroll virus
detected)

Fig 2. Relative prevalence of grapevine leafroll-associated virus species by region.



Sharma AM, Baraff B, Hutchins JT, Wong MK, Blaisdell GK, et al. (2015) Relative Prevalence of Grapevine Leafroll-Associated Virus Species in Wine Grape-Growing Regions of California. PLoS ONE 10(11): e0142120. doi:10.1371/journal.pone.0142120
<http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0142120>

Positive for GLRaV-1, 2, 3 and -5 (4LV)



**Ferrisia gilli Gullan (Hemiptera: Pseudococcidae) transmits
grapevine leafroll-associated viruses**

Journal:	<i>Journal of Economic Entomology</i>
Manuscript ID	ECONENT-2016-0149.R1
Manuscript Type:	Research Article
Date Submitted by the Author:	n/a
Complete List of Authors:	Wistrom, Christina; UC berkeley, College of Natural Resources Blaisdell, G.; UC Berkeley, ESPM Wunderlich, Lynn; University of California Cooperative Extnsn, UC Cooperative Extension Almeida, Rodrigo; UC Berkeley, ESPM Daane, Kent; Kearney Agric Center, Unknown
Please choose a section from the list:	Arthropods in Relation to Plant Disease
Field Keywords:	Vector-Borne Pathogens, Crop Protection, Berry Crop Insect, Pest Management, Vector Competence
Organism Keywords:	Pseudococcidae

Gill's mealybug
transmits GLRaV-3 as
efficiently as vine
mealybug.

It also can transmit
GLRaV-1.

More work needed.

Barbera positive for GLRaV-5 variant



Negative for leafroll in 2010 Barbera

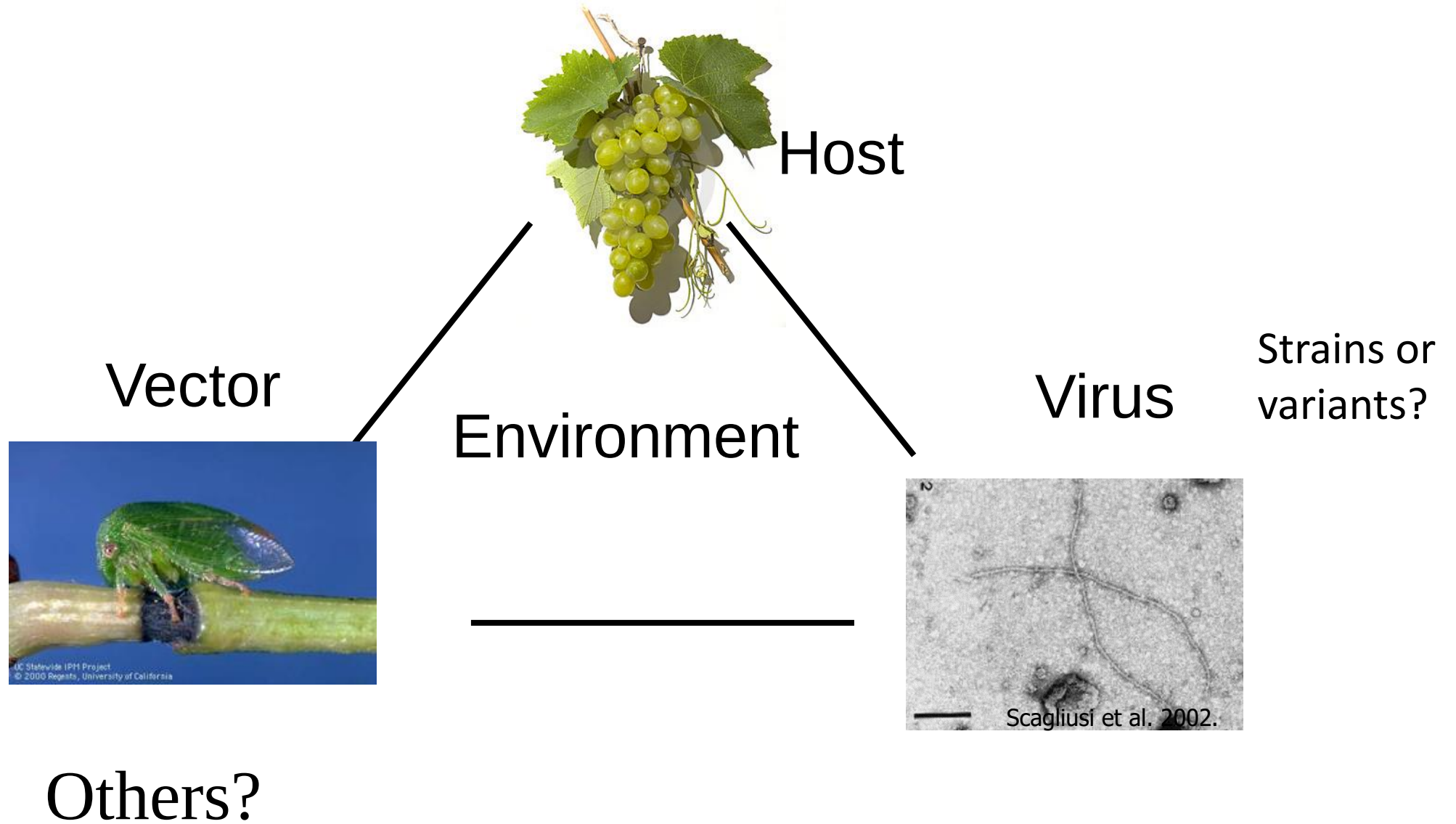


Negative Primitivo



Positive
for Red
Blotch in
2013

Grapevine Red Blotch Associated Virus (GRBaV)







Vermentino on 3309 planted 2005; Brix 22 at harvest (winemaker pleased)





Red blotch testing 2013-2015. Not random-only vines with red blotch or red leaf symptoms.



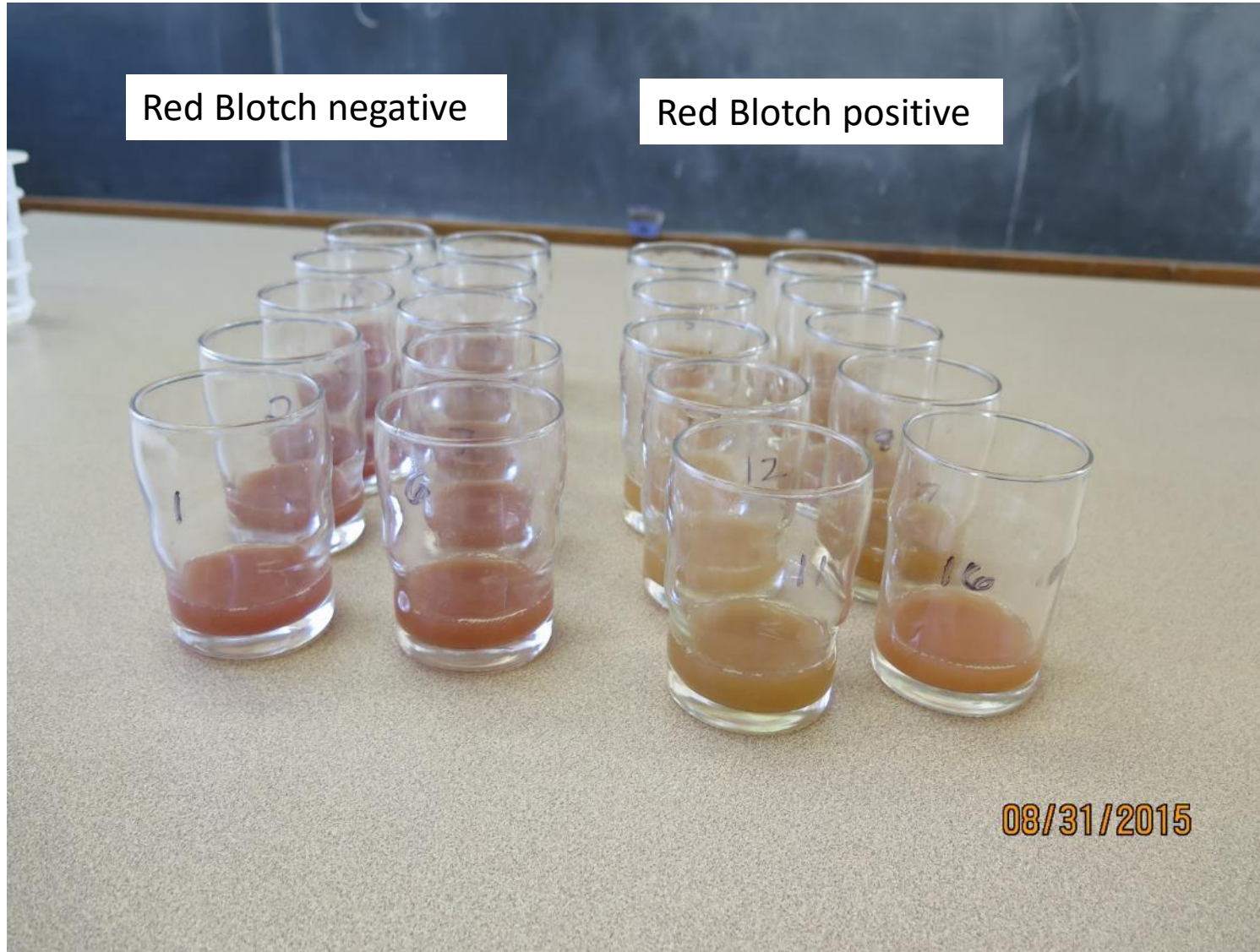
Mysore "Sudhi"
Sudarshana, USDA
virologist

2013: 10 blocks tested, 29 samples
24/29 positive.

2014: 14 blocks tested, 25 samples
13/25 positive.

2015: 20 blocks tested, 39 samples
28/39 positive.

Total tested: 65positive/94 samples
(M.S. Sudarshana, unpublished data.)



2015 Red Blotch Juice Samples

Dry farmed Zinfandel

**+ Vines positive for GRBaV,
negative for GLRaV-1 and -3.**

L.R. Wunderlich and M.S.

Sudarshana (unpublished data).

	Ave. Brix (SE) N=10	Ave.pH N=10	Ave. Berry weight (g). (SE) N=30
Neg	29.5 (0.5)	3.37	44.4 (1.1)
Pos	21.75 (0.6)	3.28	56.0 (2.1)