

# From Phages to Mealybugs - There Was Much to Discuss During the 2016 PD Research Symposium

The 2016 Pierce's Disease (PD) Research Symposium, held in San Diego December 13-14, highlighted research progress and promising new products, technologies and mechanisms to prevent and control PD in grapevines.

But this year it wasn't just about PD. Besides PD and its vectors, some of the other topics discussed included the biology and spread of red blotch, the evaluation of commercial ant baits to control vine mealybugs and methods of improving vine mealybug winter and spring controls.



Above, it was during the poster sessions that the participants had the opportunity to discuss research projects on a one-on-one basis with fellow researchers.

"We were very pleased and impressed with the quality and content of the presentations, posters, and discussions at the Symposium. They reflected the tremendous resourcefulness and creativity of the scientists engaged in research on PD, its vectors, and other pests and diseases of winegrapes," said

CDEFA PD Control Program Environmental Program Manager Tom Esser. PDF versions of the Research Symposium Proceedings from 2016 and previous years are available to download at [tinyurl.com/zw923sb](http://tinyurl.com/zw923sb).



Participants above listen to one of the many presentations that was given during the symposium about some of the current, ground breaking research that is being funded by the PD/GWSS Board.

1220 N Street  
Sacramento, CA 95814  
[www.cdfa.ca.gov](http://www.cdfa.ca.gov)



b u l l e t i n



CALIFORNIA  
PD/GWSS BOARD  
Partnership for Winegrape Pest Solutions



CALIFORNIA  
PD/GWSS BOARD  
Partnership for Winegrape Pest Solutions

W I N T E R 2 0 1 7

b u l l e t i n



INSIDE THIS ISSUE

PAGE 2

## New PD/GWSS Board Logo

- There's a new logo for the PD/GWSS Board. Find out about the new logo and why the change.

PAGE 3

## On the Research Front

- Researchers evaluate commercial ant baits as part of a pest management program for vine mealybug.
- Grapevines that exhibit novel and promising defenses against *Xylella fastidiosa* (Xf) may hold the key to reducing crop damage from PD.

PAGE 4

## PD Symposium Wrap-up

- It wasn't just about PD this year. Besides PD and its vectors, red blotch, mealy bugs and even ants were on the agenda.

## Determining What 'Certified Plant Material' Means to Growers

Kari Arnold, PhD - Post-Doctoral Researcher, Plant Pathology, UC Davis

For winegrape growers there seems to be a never-ending battle with pests and diseases. Between invasive new pests, resurgences of old diseases and even new diseases appearing in vineyards, planting with 'clean' materials has never been more important.

Today we know of over 70 viruses that can infect grapevines, and some are of great concern to winegrape production. For instance, leafroll alone has been estimated to cost as much as \$91,625 per acre during the lifetime of the vineyard due to losses in yield. Viruses are graft transmitted, meaning they can move from the rootstock to the scion or from the scion to the rootstock, and their primary means of distribution is via asexual propagation or cuttings, although some viruses can be spread by vectors in the field as well.

In order to manage viruses, many grape producers plant certified virus-screened nursery stock when establishing or re-establishing vineyards. Since the 1950s, this material has been regulated by the CDFA California Grapevine Registration and Certification Program (CGR&C), which was established to provide disease-tested, professionally identified grape scion and rootstock cultivars.

The recent discovery of the grapevine red blotch-associated virus (GRBaV), as well as the transmission and spread of grapevine leafroll-associated virus-3 (GLRaV-3), caused some in the industry to question the value of certified material.

To address these concerns, input from growers was sought out in order to form work groups to devise regional management plans of GLRaV-3. Efforts were focused on characterizing its patterns, causes and effects to aid in these plans. In addition, the prevalence and incidence of viruses in grapevines, based on the historic nature of the block, was measured to determine the incidence of viruses in old material versus new certified material.

Our studies established that growers highly value certified material for virus management. However, the spread of GLRaV-3 demonstrates the importance of identifying and removing infected plants from certified vineyard blocks and regional management.

Continued on page 2



Above, Kari Arnold surveys a vineyard for vines showing signs of virus infection.



Printed on  
100-percent  
recycled paper

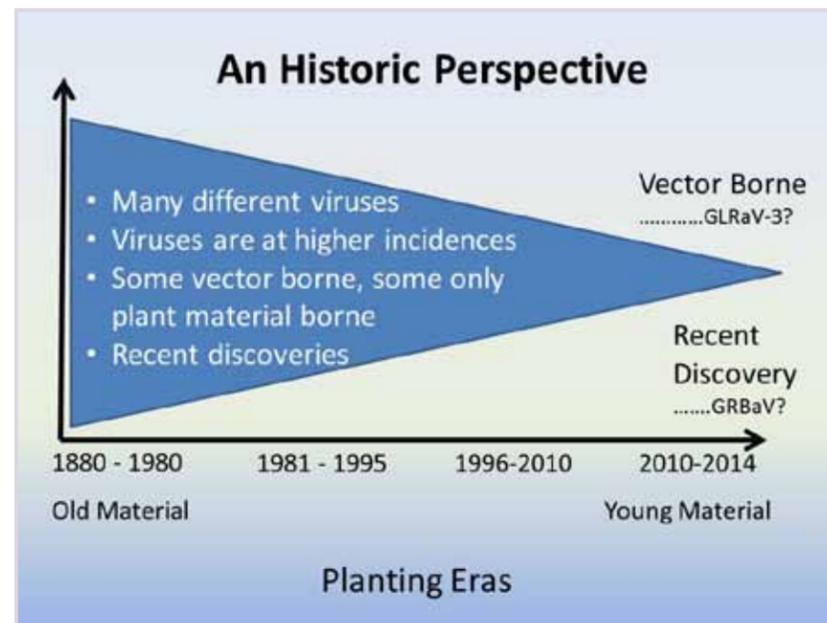
## Determining What 'Certified Plant Material' Means to Growers...continued from page 1

Other surveys revealed that older vineyards can be heavily infected with many viruses and would be a poor choice for material in new vineyards, thus strongly supporting the value of the CGR&C Program. For example, in older vineyards up to 85 percent of the vines were infected with more than one virus, with only 3 percent identified as healthy. In plantings from 2011 to 2014, identified as "young material" originating from the certification program, 81 percent were identified as healthy, and those infected were single infections involving either GLRaV-3 or GRBaV, both spread by insects.

The CGR&C Program was created in the 1950s when these grapevine viruses were thought to be distributed only by the movement of asexual propagation. Its stated intention was to provide "virus-free" material to growers by selecting material which was not displaying symptoms related to viruses at the foundation level for distribution.

Since the CGR&C Program was established, some of the regulated viruses have been shown to be transmitted by vectors, and additional viruses have been discovered which make the term "virus free" unrealistic. Although the CGR&C Program no longer uses the terminology "virus free," the industry still does, which can lead to mistrust in the supply chain between growers and plant nurseries. The most recent example of this was the discovery of GRBaV and the development of a test for it, which led to the discovery that GRBaV was and had been present in vineyards for years. Its discovery raised another concern: what other unknown viruses are there that we don't have a test for yet? This is why Foundation Plant Services is investing their time and expertise into that very question.

However, a misunderstanding still remains about what the certi-



This chart represents the decline of infected plant materials in more recent generations of vineyards.

fication program means and how it serves growers. The program tests source vines for detrimental grape viruses. This is especially important when some grape viruses can take years before they express themselves in the vines they are infecting.

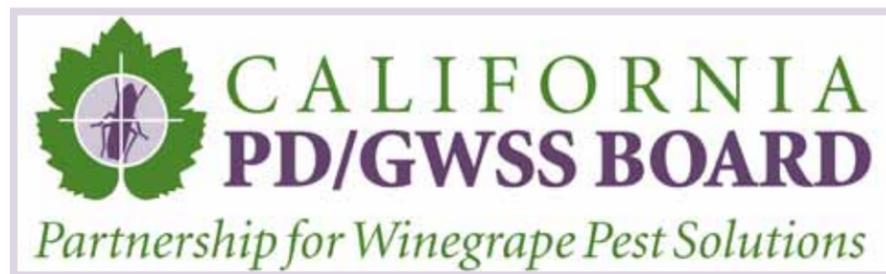
Currently extension and outreach programs are underway to provide growers with a better understanding of the value of the CGR&C Program to growers. Additionally, further studies are needed to better understand background infections as well as the reinfection rate in registered blocks where certified material is obtained in order to provide better disease management practices. Please contact Kari Arnold at [klarnold@ucdavis.edu](mailto:klarnold@ucdavis.edu) if you are interested in learning more or want to take part in this study.

## New Logo for the PD/GWSS Board

The PD/GWSS Board has a new logo reflecting the broader role of the Board in developing solutions to winegrape pests and disease.

While Pierce's disease and the glassy-winged sharpshooter are still the Board's primary focus, other pests and diseases that threaten California's winegrapes are also being addressed. The new logo reflects the partnership nature of the Board, which helps make its efforts so successful.

The new logo will slowly be integrated into the website and used in future printed materials like the newsletter, brochures and displays.



## On the RESEARCH FRONT



## CALIFORNIA PD/GWSS BOARD

Partnership for Winegrape Pest Solutions

### Evaluation of Commercial Ant Baits as a Component of an Integrated Pest Management Program for Vine Mealybug

Co-Principal Investigators: Monica L. Cooper, UC Coop. Extension, UC Napa & Lucia G. Varela, UC Coop., UC Santa Rosa



The Argentine ant is 3-4 mm long, deep brown to light black, moves rapidly in distinct trails and feeds on honeydew.

The vine mealybug is a destructive pest in California vineyards. Grape growers use many tactics, including insecticides, mating disruption, and biological control to manage their populations. However the invasive Argentine ant, common in coastal California vineyards, disrupts pest management programs for vine mealybug by interfering with small parasitic wasps that attack vine mealybug. Ant baits are an effective approach for managing ant populations while minimizing impact on non-target organisms. Studies are underway to investigate the potential of commercial and experimental baits to control Argentine ants in vineyards. Both baits reduced ant activity in the treated areas, although the effect was more sustained with the experimental bait.

### Assessing Pierce's Disease Spread in Grape Lines With Novel Defensive Traits

Principal Investigator: Rodrigo Almeida, Dept. Environ. Sci., Policy & Mgmt., UC Berkeley

The Pierce's disease (PD) research community has developed grapevines that exhibit novel and promising defenses against *Xylella fastidiosa* (Xf) and have the potential to reduce crop damage from PD. However, it is unknown if these novel traits will increase or decrease the large-scale spread of PD in vineyards, which is a critical dimension of sustainable disease management. This study is conducting transmission experiments with important insect vectors of Xf and analyzing the data to explore disease spread using mathematical models. The researchers are assessing the efficacy of defenses by comparing simulated spread in defended and susceptible vineyards, and using this data to inform vineyard managers on how to minimize disease outbreaks across California.

Right, a grape leaf stricken with PD showing the classic 'burnt' look.



GWSS on a yellow sticky trap removed from a vineyard near Bakersfield.

### Management of Insecticide Resistance in Glassy-Winged Sharpshooter Populations Using Toxicological, Biochemical and Genomic Tools

Principal Investigators: Richard Redak, Bradley White and Frank Byrne, Dept. of Entomology, UC Riverside

It's been confirmed that the glassy-winged sharpshooters (GWSS) in the General Beale Road citrus-growing area are exhibiting high levels of imidacloprid resistance, based on data generated from topical application bioassays. In addition, shifts in pyrethroid susceptibility were also detected. During the summer of 2016, adult GWSS insects were collected and examined from citrus groves in Kern, Tulare and Riverside counties, and were compared with toxicology data that was generated in 2003 for GWSS populations in Riverside County. The researchers are currently comparing DNA data for pyrethroid and nicotinic receptor genes in insects from the different populations to determine whether mutations known to confer insecticide resistance in other insect species occur in GWSS. This information will be helpful in determining which new treatment methods will be the most successful.