CALIFORNIA PD/GWSS BOARD
Partnership for Winegrape Pest Solutions

2023 – ISSUE 3

bulletin

cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

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Five Key Steps to Slow the Spread of the Glassy-Winged Sharpshooter

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As is typical with most challenging situations, protecting California's winegrapes from pests and diseases such as Pierce's disease (PD) takes a multi-pronged, collaborative approach.

The California Department of Food and Agriculture's Pierce's Disease Control Program (PDCP) provides much-needed protection to the state's valuable wine and grape industry with five core strategies: contain the spread, statewide survey and detection, rapid response, outreach, and research.

"A key accomplishment of the PDCP is the detection and eradication of 18 GWSS infestations since 2000," said Joseph Damiano, PDCP statewide coordinator. "The continuing strength and vitality of grape production in California bears testimony to the effectiveness and success of the statewide cooperative PDCP."

The PDCP was established in 2000 in response to the devastation PD spread by the glassy-winged sharpshooter caused in Temecula Valley's vineyards. For the last 20-plus years, the PDCP and its partners have slowed the spread of GWSS and minimized the statewide impact of PD, while the Pierce's Disease and Glassy-Winged Sharpshooter Board's research and outreach program investigates winegrape pests and diseases and delivers practical and sustainable solutions to growers.

CONTAIN THE SPREAD

The PDCP prevents the spread of GWSS to uninfested areas of the state through nursery inspections, trapping, and treatment; bulk citrus inspections; area-wide treatment programs; and biological control.

Nursery Inspections:

Over half of the state's nurseries are located in GWSS-infested counties and many ship to non-infested areas. PDCP leads several activities to reduce the risk of moving GWSS on nursery stock, including inspections before and after shipping, trapping, and treatments. In 2022 there were over 37,000 nursery stock shipments from infested to non-infested areas. Origin county inspectors stopped 91 GWSS egg masses, 11 GWSS nymphs, and four adults. Only two viable GWSS life stages were discovered at the destination.

Nursery Treatments and Trapping:

Nurseries participating in the Nursery Stock Approved Treatment Program (ATP) can ship treated nursery stock to non-infested areas without an origin inspection. In 2022, nine participating nurseries shipped over 1.9 million plants from 29 nursery yards. Forty-six counties received plant material from ATP nurseries, with no viable GWSS found in any shipments. Trapping is also done in and around ATP nurseries. If more than 10 GWSS are trapped within a two-week period, all nursery host plant material within a 100 foot radius is treated.

Bulk Citrus:

Citrus trees are primary hosts for GWSS throughout the year. When the weather is warm, the insects are active and will flee the disturbances associated with harvest to nearby vineyards. Once temperatures cool, GWSS are relatively inactive and can end up in picking bags with harvested fruit, ultimately turning up at processing facilities in other parts of the state. During the most recent citrus-shipping season (October 2021 – September 2022), only two live GWSS were found out of 20,388 certified destination inspections of bulk citrus.

Biological Control:

GWSS biological control agents are tiny wasps destroying GWSS eggs while not harming humans or other insects. Through repeated life cycles, the parasitic wasps kill GWSS eggs and contribute to the suppression of GWSS populations. Three wasp species are produced at the CDFA-PDCP Arvin Biological Control facility in Kern County. More than 2.8 million biological control agents have been released at agricultural, riparian, and urban sites in 16 counties since 2001.

Area-wide Management:

PDCP coordinates GWSS management efforts, including trapping and treatments, in large, agriculturally diverse grape and citrus production areas where GWSS is present. More than 27,000 acres were treated in Fresno, Kern, and Tulare counties over the last year.

STATEWIDE SURVEY AND DETECTION

The PDCP quickly locates new GWSS infestations and confirms that non-infested, at-risk areas remain free of infestation. PDCP works with counties to conduct trapping in urban and residential areas and nurseries to determine if GWSS is present. Yellow panel traps are deployed in 43 counties that are not infested or are partially infested with GWSS. During the peak of the residential/urban trapping season, which runs May 1 - Oct. 31, approximately 33,000 traps are deployed and serviced statewide. Any GWSS finds trigger the PDCP's rapid response protocol.

RAPID RESPONSE

The PDCP quickly responds to detections of GWSS in new areas. PDCP and the local agricultural commissioner conduct delimitation surveys consisting of high-density trapping and visual inspections of host plants in the area to determine if an infestation is present and, if so, to identify the boundaries. PDCP works with county agricultural staff, residents and growers to treat infested areas. No new GWSS infestations have been found since the Solano County infestation in 2021. The PDCP manages ongoing monitoring and eradication or suppression efforts in existing GWSS-infested areas in Fresno, Madera, Solano, and Tulare counties.

on the RESEARCH FRONT

CALIFORNIA PD/GWSS BOARD

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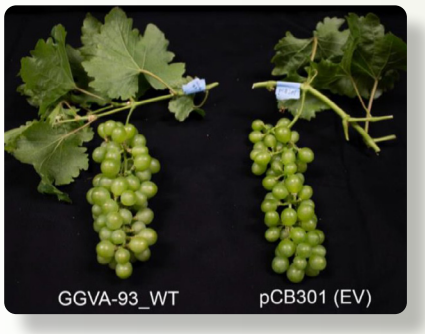


The team watched vines for symptoms of infection to evaluate viral vectors for delivering RNAi

Virus-Based Delivery of Interfering RNAs Targeting Grapevine Leafroll-Associated Virus(es) (GLRaVs)

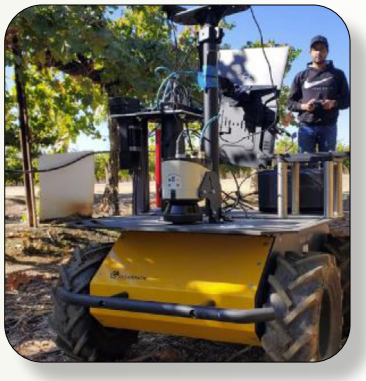
Project leaders: Yen-Wen Kuo and Bryce W. Falk, University of California, Davis

The team established techniques for virus-based delivery of interfering RNAs in grapevines, including: 1) developing a protocol for delivering plasmid constructs of viral infectious clones or protein expression plasmids into greenhouse-grown grapevine plants, 2) delivering viral infectious clones of three grapevine viruses into four different cultivars of full-grown grapevine plants and detecting the viral replication in the tested plants, 3) finding optimal insertion sites in the viral infectious clones that can express RNAi inducers in grapevine plants, and 4) obtaining and analyzing the sequences of GLRaVs for potential strong targets.

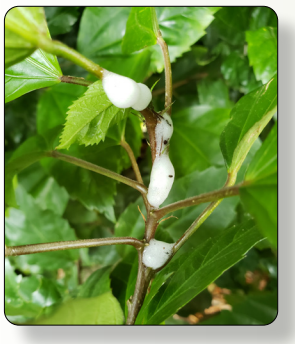
Autonomous Field-Scouting of Virus Infections in White Varieties and Pre-Symptomatic Vines

Project leaders: Luca Brillante, California State University, Fresno and Marc Fuchs, Cornell University

An expert eye can recognize symptoms of grapevine red blotch virus and grapevine leafroll-associated viruses in red varieties, but it is much harder to assess in white varieties or in red varieties that are pre-symptomatic. The team will use images gathered by autonomous aerial and ground vehicles to assist in identifying symptoms in infected grapevines before they are visible to the human eye in red varieties or hard to recognize in white varieties. The team's main objective is to develop new tools to detect infected vines and enhance the speed and reliability of detection methods in vineyard conditions.



Using an unmanned ground vehicle to gather images of infected vines



Spittlebugs feed on plant sap and then excrete bubbly foam to protect themselves

Taxonomic Status, Population Structure and Identification Methods for the Vineyard Spittlebug *Aphrophora sp.*, a Suspect *Xylella fastidiosa* Vector

Project leaders: Vinton Thompson, American Museum of Natural History and Manpreet Kohli, Baruch College, City University of New York

The most likely suspect causing Pierce's disease in vineyards without sharpshooters is a spittlebug which closely resembles the western pine spittlebug. This study aims to identify consistent DNA variations that can distinguish the vineyard spittlebug from the western pine spittlebug. The findings will serve several purposes: 1) establishing the vineyard spittlebug as a new species, 2) understanding the spread of spittlebugs among vineyards in the Sonoma and Napa regions, and 3) developing a simple DNA test for others to identify these insects.

The CDFA PD/GWSS Board partners with other organizations to leverage funding for research and outreach projects. Funding partners include the American Vineyard Foundation, the Consolidated Central Valley Table Grape Pest and Disease Control District, the USDA Agricultural Research Service, and other organizations.

PD/GWSS Assessment Rate Set at $1.25 for 2023 Harvest

To continue funding crucial research combating winegrape pests and diseases, the Pierce's Disease/ Glassy-Winged Sharpshooter Board kept the PD/GWSS Winegrape Assessment rate at $1.25 per $1,000 value for the 2023 harvest.

The Board ensures grower funds are utilized wisely and productively to support the development of innovative solutions to PD, GWSS, and seven additional designated winegrapes pests and diseases. The 2023 assessment is expected to bring in an estimated $5.0 million. View the full list of pests and diseases online at bit.ly/3qSSPQ8.

"As the PD/GWSS Board, our responsibility lies in protecting the interests of the winegrape industry and promoting its long-term sustainability," said PD/GWSS Board Chair William Drayton. "The PD/GWSS assessment allows us to effectively allocate resources towards comprehensive research efforts, enabling leading scientists to tackle the ever-evolving challenges posed by pests and diseases."

The assessment has averaged $1.35 per $1,000 of value and has collected $83.1 million since 2001. The Board advises the California Department of Food and Agriculture on the best use of assessment funds, with $55 million invested in 282 research grants.

The Board has been at the forefront of safeguarding the California winegrape industry against devastating threats since winegrape growers passed the first PD/GWSS Referendum in 2000. The PD/GWSS Referendum is conducted every five years and will take place again in 2025. Learn more about Board-funded research, including a list of current research projects, at bit.ly/3w27mtc.

282
TOTAL GRANTS
funded by the PD/GWSS Board since 2001

$42.5
MILLION
invested in PD & GWSS research since 2001

$12.4
MILLION
invested in research for other pests & diseases since 2010