



20

23

**PIERCE'S DISEASE
CONTROL PROGRAM**

Report to the Legislature



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

Statement of the Secretary

Progress. Since grape growers created the Pierce's Disease Control Program more than two decades ago, that has been the constant, consistent, reliable product of this cooperative effort. When it began, we knew – all of us, from grape growers and winemakers to the broader slate of stakeholders and “wine country” communities that identify with and rely on this segment of our agricultural industry – we knew it wouldn't be easy. In fact, media coverage and scientific prognostication at the very beginning of this millennium would have had us believe it was going to be very, very hard to shield California from the unique threat posed by the glassy-winged sharpshooter and Pierce's disease. But the stakes were high, and the growers and vintners were as dedicated to this project then as they remain today. Along the way, those farmers were joined by our state's nursery growers and others affected by the pest and the disease. Their cause was also taken up by local leaders, legislators and researchers. And it is that spirit of collaboration that has seen us through.

Those of us who were there at the beginning of this program can say with pride that we have stayed the course – but this isn't about pride; it's about getting the job done. Providing solutions for growers. I encourage you to review this report not as a conclusion, but as a marker of continued success and continuing commitment to a problem well worth solving. That's my promise, in keeping with the steadfast dedication, investment and accomplishments of our growers, researchers and stakeholders in this exemplary program all along.

Karen Ross, Secretary

*California Department
of Food and Agriculture*



Table of Contents

Background.....	4
Program Description.....	7
Contain the Spread	10
Statewide Survey and Detection	22
Rapid Response.....	23
Outreach and Education	25
Research	29
Environmental Compliance.....	31
Financial Statement.....	32

This report can be viewed at cdfa.ca.gov/pdcp/ReportsToLegislature.html.
To order a hard copy of this report, please email PDCPinfo@cdfa.ca.gov.



Executive Summary

This report is being submitted as mandated by Section 6046(i) of the California Food and Agricultural Code and provides the Legislature with an update on the California Department of Food and Agriculture's (CDFA) expenditures, progress, and ongoing priorities and challenges in combating Pierce's disease (PD) and its vectors in California.

PD is a lethal disease of grapevines. It is a serious threat to grapevines throughout the southern United States and is particularly threatening to California's thriving grape industry. The bacterial pathogen which causes PD, *Xylella fastidiosa* (*Xf*), has been present in California for more than a century. While many insects can vector *Xf*, the establishment and spread of the glassy-winged sharpshooter (GWSS), in California in the 1980s and 1990s created a new and serious threat of significant statewide damage.

At risk is California's grape and wine industry, which generates annual economic activity of \$73 billion within the state and \$170.5 billion nationally. The Pierce's Disease Control Program (PDCP) works to halt the spread of GWSS until research finds solutions to PD.

The PDCP's operational approach relies on five major components: [contain the spread](#), [statewide survey and detection](#), [rapid response](#), [outreach](#), and [research](#). Since the inception of the PDCP in 2000, these components have proven to be an effective means for slowing the spread of GWSS and minimizing the statewide impact of PD.

The PDCP implements its statewide strategy in collaboration with several agencies and cooperators. The United States Department of Agriculture (USDA), the California County Agricultural Commissioners, the University of California (UC), the Pierce's Disease and Glassy-winged Sharpshooter Board (PD/GWSS Board), and the Pierce's Disease Advisory Task Force all contribute to the success of the program.

Funding for the PDCP comes from three primary sources: The USDA's Animal and Plant Health Inspection Service, California's winegrape growers, and the State General Fund on occasion.



The Pierce's Disease Control Program's operational approach has proven to be an effective means for slowing the spread of the glassy-winged sharpshooter and minimizing the statewide impact of Pierce's disease.

In 2021, a new GWSS infestation was found in Northern California for the first time in over a decade. Initial finds in the city of Vacaville in Solano County triggered delimitation and treatment activities. The PDCP continues to support Solano County with its efforts to eradicate GWSS. Although there were additional finds in 2023, there were fewer finds compared to previous years and the finds did not result in any expansion of the original infested area boundaries. The PDCP remains optimistic that the continued efforts will result in eventual eradication in the Vacaville area.

Since 2001, the PD/GWSS Board has invested \$55 million of industry funds to support over 283 research grants to protect vineyards, prevent the spread of pests and diseases, and deliver practical and sustainable solutions. Research is focused on PD and GWSS, and other designated pests and diseases of winegrapes, including brown marmorated stink bug, European grapevine moth, grapevine fanleaf disease, grapevine leafroll disease, grapevine red blotch disease, spotted lanternfly (SLF), and mealybugs. In 2023, the National Academy of Sciences (NAS) conducted a comprehensive review of the Board's grapevine virus research program and provided recommendations to ensure growers' dollars continue to be invested wisely in research to find solutions to winegrape pests and diseases. The PDCP and the PD/GWSS Board will continue to work together to implement recommendations from the NAS as the review continues in 2024. Additionally, an economic study to re-evaluate the economic impacts of PD and the PDCP commenced in late 2023, which was last investigated a decade prior.

As the spread of SLF in other states continues to threaten California's agriculture and natural resources, the PD/GWSS Board has continued to provide outreach support for the industry through various outreach materials and ad campaigns in industry publications.

The PDCP continued to face financial challenges in 2023 as the program has not seen an increase in federal funding since 2015 and annual state funding ceased in 2011. The PDCP is grateful for the continued support from the PD/GWSS Board as it agreed to provide additional support for rapid response activities and administration costs. However, the program costs continue to outpace the additional support and the PDCP will need to reduce program activities to remain within budget in the near future. The PDCP’s priority for 2024 is to focus on implementing programmatic changes while protecting program stability and effectiveness.

Among the many major accomplishments over the life of the program are the detection and eradication of 18 incipient infestations of GWSS. The continuing strength and vitality of grape production in California bears testimony to the effectiveness and success of the statewide cooperative PDCP.

ABBREVIATIONS & ACRONYMS

ABBREVIATION OR ACRONYM	TERM
ATP	Approved Treatment Program
CACASA	California Agricultural Commissioners and Sealers Association
CCVTGPDCD	Consolidated Central Valley Table Grape Pest & Disease Control District
CDFA	California Department of Food & Agriculture
GWSS	Glassy-winged sharpshooter
PD	Pierce's disease
PDCP	Pierce's Disease Control Program
PD/GWSS Board	Pierce's Disease and Glassy-winged Sharpshooter Board
NAS	National Academy of Sciences
SLF	Spotted lanternfly
UC	University of California
USDA	United States Department of Agriculture
<i>Xf</i>	<i>Xylella fastidiosa</i>

Background

THE THREAT

PD is a fatal bacterial disease of grapevines that is spread by certain types of insects, such as leafhoppers. It has been present in California for more than 100 years and in the past has caused sizable losses to viticulture in localized “hotspot” areas of the state. Until the late 1990s, it did not pose a severe threat to the majority of areas currently under grape production.

This situation changed dramatically with the arrival of the GWSS, an aggressive insect vector of PD. Because of this insect, viticulture in traditionally safe growing regions is at risk from the disease. Considering only grapes, PD threatens a crop production value of \$5.54 billion, associated economic activity within California of approximately \$73 billion, and \$170.5 billion annually to the national economy. Other crops and ornamental plants such as almonds (\$3.52 billion), susceptible types of citrus (\$2.22 billion), stone fruits (\$1.1 billion), and shade trees are at risk. To counter this threat, the PDCP was established within the CDFA to minimize the statewide impact of PD.

PIERCE'S DISEASE

PD in grapevines was first noted in California near Anaheim around 1884. The disease is caused by a strain of the bacterium *Xf* that kills grapevines by triggering cell death in the plant. Several strains of this bacterium exist in the world, attacking and causing damage to different host plants, including grapes, citrus, stone fruits, almonds, oleander, and certain shade trees, such as oaks, elms, maples, and sycamores. The UC reported that the disease destroyed over 1,000 acres of grapevines in Northern California between 1994 and 2000, causing \$30 million in damage.¹ There is currently no known cure for PD.



Vine showing symptoms of Pierce's disease

¹ Report of the Pierce's Disease Research and Emergency Response Task Force

THE GLASSY-WINGED SHARPSHOOTER

GWSS was first reported in California in 1994 but likely arrived in the state in the late 1980s. It is native to the southeastern United States and northeastern Mexico. It feeds on the xylem fluid of a large number of plants. This sharpshooter can build up large populations on a diverse array of host plants and is a strong flier, traveling greater distances than native sharpshooters.



Adult glassy-winged sharpshooter

GWSS clearly has the potential to increase both the incidence and severity of PD in California. As observed in various infestations, the sharpshooter:

- Builds to high populations that substantially increase the number of insects vectoring the destructive *Xf* bacteria to crops;
- Travels longer distances in a shorter time than other sharpshooters;
- Makes use of more breeding habitats and plant hosts than native vectors; and
- Transmits the bacteria from vine to vine, resulting in an exponential increase in disease incidence in vineyards.

The combination of PD and GWSS constitutes an unprecedented threat to California's multi-billion-dollar grape and wine industry, as well as to almonds, and other crop and ornamental plants.

Pierce's Disease and Glassy-winged Sharpshooter in California



December 31 2023

Program Description

The PDCP works to minimize the impact of PD in California. The strategy is to slow or stop the spread of GWSS while short- and long-term solutions to PD are developed. This strategy relies upon the following five elements:

1. CONTAIN THE SPREAD

Prevent the artificial spread of GWSS to new areas of the state by regulating shipments of host plants and other host material and prevent the natural spread of GWSS by suppressing populations.

2. STATEWIDE SURVEY AND DETECTION

Find new GWSS infestations quickly and confirm that uninfested, at-risk areas remain free of infestation by conducting systematic trapping.

3. RAPID RESPONSE

Respond quickly to detections of GWSS in new areas by intensively surveying the area and applying treatments if necessary.

4. OUTREACH

Raise awareness about PD and its vectors by providing information, answering questions, and responding to the concerns of growers and the public through outreach and education activities.

5. RESEARCH

Develop long-term, sustainable solutions to PD and its vectors by sponsoring and facilitating research and development.

Organization

The PDCP is a partnership that includes the CDFA, the county agricultural commissioners, the USDA, the UC, other state and local agencies, industry, and various agricultural organizations throughout the state.

A statewide coordinator directs the program following the policies and priorities established by the Secretary of the CDFA. Program staff are located throughout the state and are responsible for coordinating and implementing program activities, including:

- Working closely with county agricultural commissioners to ensure program activities meet all statutory and regulatory requirements.
- Scientists at the CDFA Plant Pest Diagnostics Center provide pest identification services.
- Biological control agents are produced at a facility in Arvin and released where needed.
- Researchers throughout the state and elsewhere conduct research geared toward finding solutions to PD.

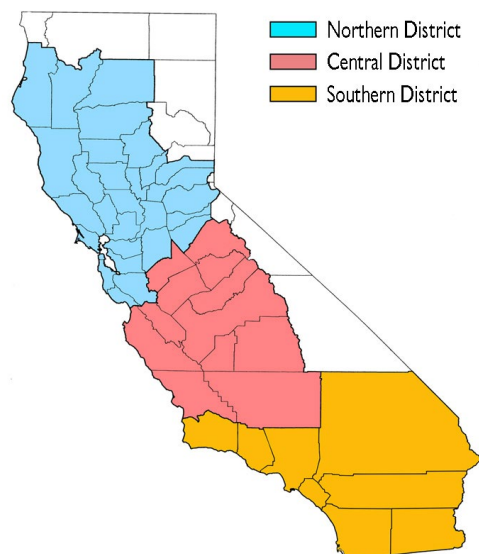
County Workplans

The county agricultural commissioners are responsible for conducting local PDCP activities, guided by workplans developed by the county agricultural commissioners and submitted to the CDFA for approval.

In compliance with California Food and Agricultural Code Section 6046, county workplans must include the following elements:

- Identification of a local coordinator;
- Ongoing training of employees in the biology, survey, and treatment of PD and its vectors;
- Proposed response to the discovery of the disease and its vectors (including delimitation and treatment);
- A system to track and report new infestations; and
- Outreach presentations and training in local communities that respond to local concerns.

PIERCE'S DISEASE CONTROL PROGRAM DISTRICTS



Some program activities are conducted year-round. County agricultural commissioners submit monthly activity reports to the CDFA. Audits are conducted in one or more counties each year to verify the accuracy and appropriateness of charges and expenditures.

Advisory Groups

Several groups advise the PDCP, including:

PIERCE'S DISEASE AND GLASSY-WINGED SHARPSHOOTER BOARD

The PD/GWSS Board is composed of 14 representatives from the winegrape industry, plus one member from the public. The purpose of the PD/GWSS Board is to provide recommendations to the Secretary of CDFA on the use of funds collected under the PD/GWSS winegrape assessment, a statewide value-based assessment that has raised approximately \$86.4 million over the last 22 years. The PD/GWSS Board is advised by committees established to focus on specific areas and issues.

PIERCE'S DISEASE ADVISORY TASK FORCE

The Pierce's Disease Advisory Task Force is composed of county agricultural commissioners, scientists, agricultural industry representatives, and other experts. The Task Force reviews program progress and develops recommendations for the Secretary of CDFA. Similar to the PD/GWSS Board, the Task Force is advised by committees established to focus on specific areas and issues.

CALIFORNIA AGRICULTURAL COMMISSIONERS AND SEALERS ASSOCIATION / GLASSY-WINGED SHARPSHOOTER ADVISORY GROUP

The California Agricultural Commissioners and Sealers Association (CACASA)/GWSS Advisory Group is composed of agricultural commissioner representatives from each of the five CACASA area groups in the state. This group meets periodically to discuss issues of statewide and regional concern and to promote program consistency and good communication among state and county cooperators.

Contain the Spread

The Contain the Spread element of the program is designed to prevent the spread of GWSS to uninfested areas of the state on articles and commodities shipped from infested areas. Emergency regulations governing the movement of nursery stock and bulk grapes were first adopted in 2000. Regulations on bulk citrus were added later, following finds of live GWSS in bulk citrus shipments. Permanent program regulations were adopted in 2003. In partially infested areas, area-wide management programs were established to suppress GWSS populations and to reduce their damage and spread.

Nursery

Nursery stock is a high-risk commodity for spreading GWSS. Approximately 54% of California's 13,262 licensed nursery locations are located in GWSS-infested counties. Many of these nurseries ship to non-infested areas of the state. Activities to mitigate the risk of moving GWSS on nursery stock include:

- Inspection of nursery stock in infested areas prior to shipping to non-infested areas;
- Treatment of nursery stock when necessary;
- Certification of shipments;
- Inspection of nursery stock at receiving nurseries prior to sale; and
- Trapping in and near nurseries shipping to non-infested areas.

INSPECTION RESULTS

- In 2023, there were 32,700 shipments of nursery stock from infested areas destined for non-infested areas. One viable life stage of GWSS was discovered at the destination. Origin county inspectors stopped 52 egg masses, eight nymphs, and 17 adults from moving in nursery stock shipments.
- Over 90% of all rejections since 2001 have been for viable GWSS egg masses. The table on [page 12](#) presents the results of the ongoing nursery inspection and shipment certification program.



ENFORCEMENT ACTIONS

Enforcement actions are taken against nurseries and shipments that violate the regulations.

Actions that can be taken at the origin of nursery shipments include:

- **Restriction:** The nursery is restricted from shipping certain species of host material out of the infested area for a period of time, until the pest risk is mitigated.
- **Suspension:** The nursery is suspended from shipping all host material out of the infested area until the pest risk is mitigated.
- **Revocation:** The nursery's compliance agreement is revoked, and it cannot ship any host material out of the infested area for an established period of time.

Actions that can be taken at the destination of nursery shipments include:

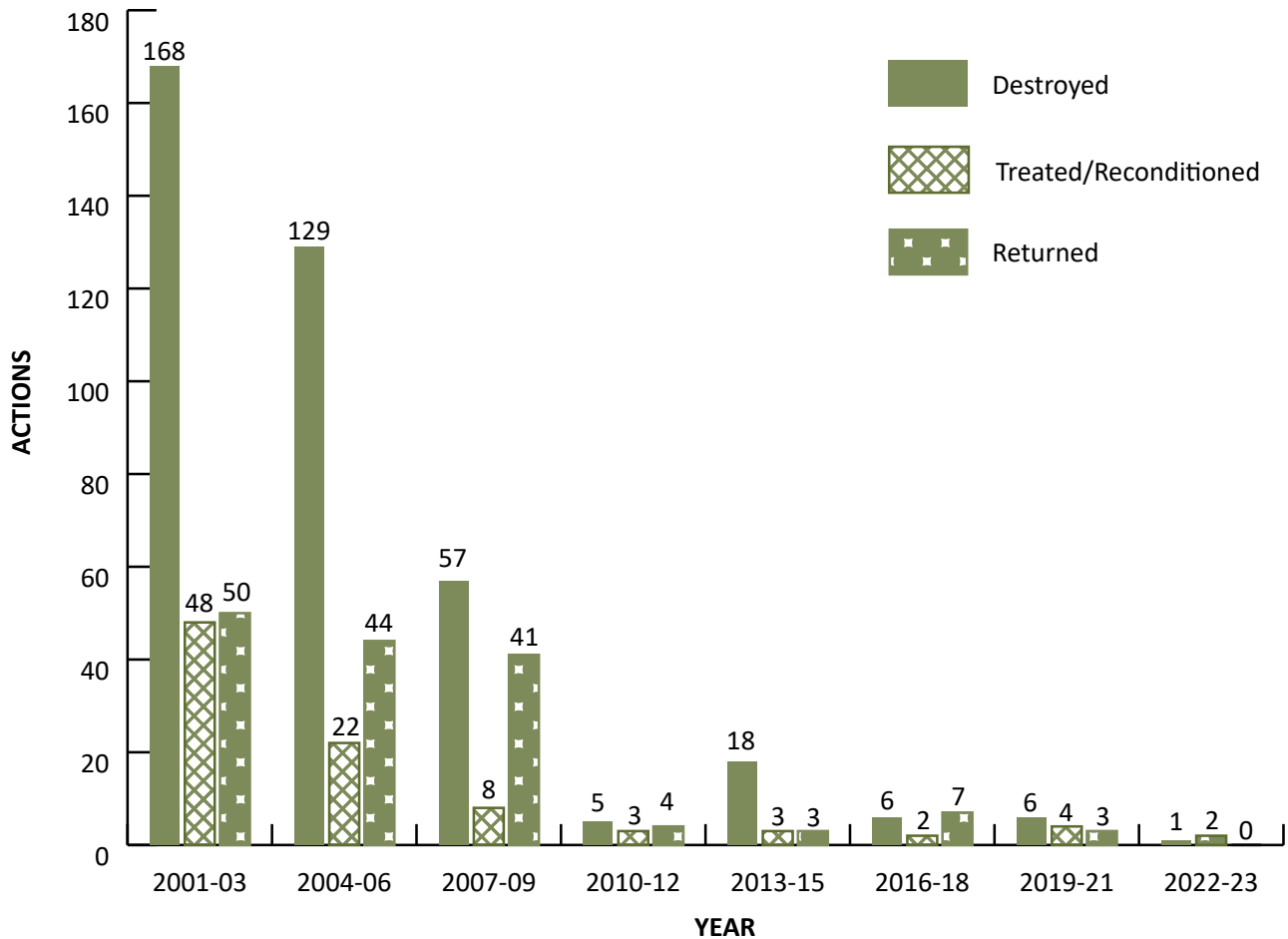
- **Treatment/Recondition and Release:** The nursery shipment is treated with an effective material and/or receives a 100% visual inspection with no additional finds and is released to the receiver.
- **Return:** The shipment is returned to its origin.
- **Destruction:** The shipment is destroyed.

Shippers and receivers who violate nursery stock regulations are subject to fines. In 2023, administrative penalties were levied against two companies, totaling \$800.

REGULATED NURSERY SHIPMENT RESULTS

YEAR	NUMBER OF SHIPMENTS	GWSS FOUND AT DESTINATION	% FREE OF GWSS AT DESTINATION
2001	57,600	149	99.74%
2002	65,800	77	99.88%
2003	65,000	40	99.94%
2004	76,700	64	99.92%
2005	72,600	84	99.88%
2006	69,000	47	99.93%
2007	73,100	46	99.94%
2008	62,600	37	99.94%
2009	53,700	23	99.96%
2010	50,600	6	99.99%
2011	44,500	4	99.99%
2012	44,600	2	99.99%
2013	45,800	6	99.99%
2014	44,000	12	99.97%
2015	38,000	6	99.98%
2016	36,000	9	99.97%
2017	36,700	6	99.98%
2018	34,400	0	100%
2019	43,300	6	99.99%
2020	40,800	5	99.99%
2021	39,800	2	99.99%
2022	37,200	2	99.99%
2023	32,700	1	99.99%

NURSERY SHIPMENT DESTINATION ACTIONS



NURSERY STOCK APPROVED TREATMENT PROGRAM

The Nursery Stock Approved Treatment Program (ATP) launched in 2008, following a successful three-year pilot program. With the ATP, qualified nurseries are allowed to ship nursery stock, treated with specified materials, to non-infested areas without an origin inspection. These materials are 100% efficacious at killing emerging GWSS nymphs.

In 2023, nine participating nurseries shipped approximately 1.47 million plants in 7,804 shipments. There was a total of 28 nursery yards associated with these nine nurseries. Forty-six counties received plant material from ATP nurseries throughout the year, with no viable GWSS found in any shipments.

Trapping is conducted in ATP nurseries as part of the pest management plan to monitor pest pressure.

Traps are maintained at two traps per acre in all ATP nurseries. If a trap exceeds the threshold of 10 GWSS within a two-week period, then all host plant material within a 100-foot radius is placed on hold and must be treated within five days. If treatment is not conducted within five days, plants within the 100-foot radius are held for a minimum of two weeks from the time the next treatment is applied.

All trapping at ATP nurseries is conducted by county or PDCP staff. Results from the 2023 trapping efforts are as follows:

2023 ATP NURSERY TRAPPING SUMMARY

NURSERY YARDS PARTICIPATING	NURSERY ACRES	TRAPS DEPLOYED	TRAPS WITH >10 GWSS
28	1,366	2,823	217

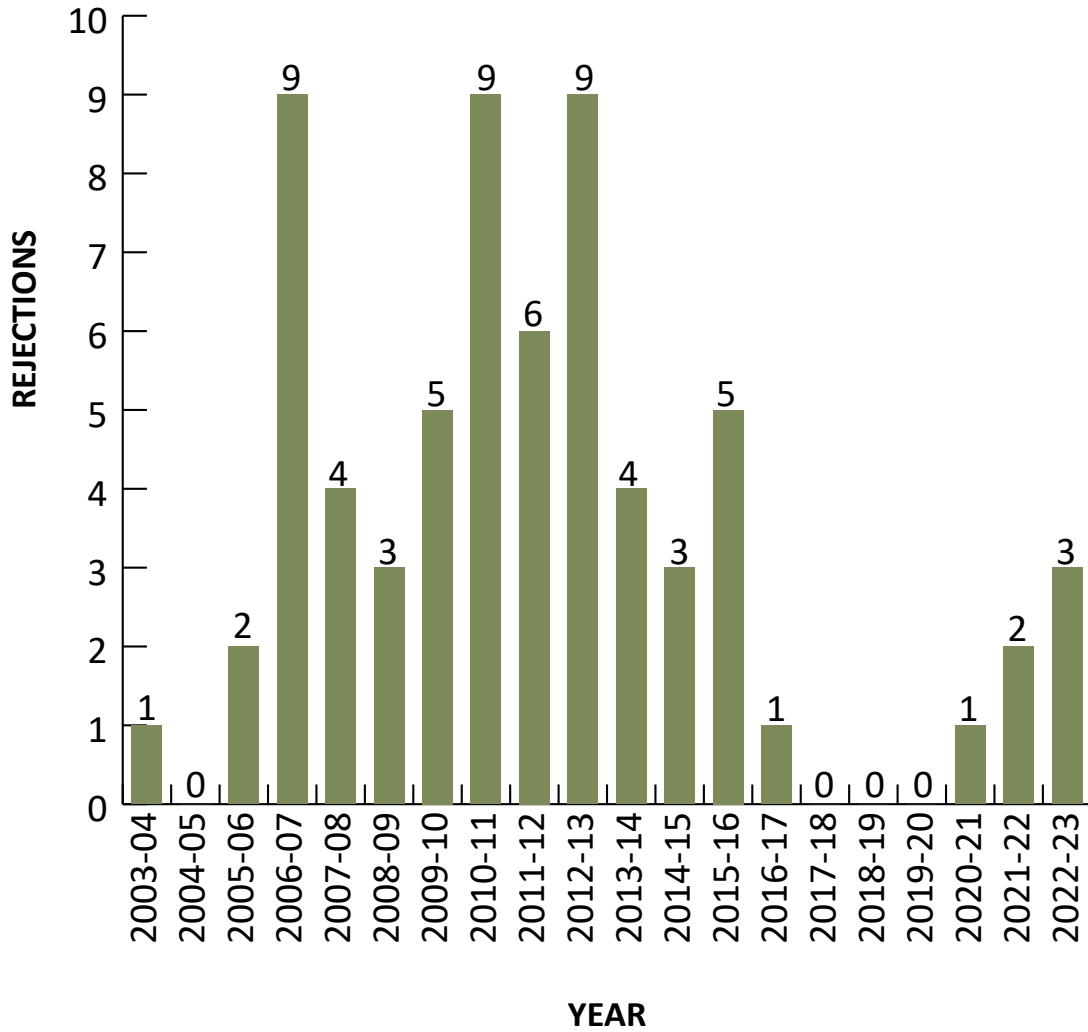
Nursery stock being shipped under this program must be treated with approved products under the supervision of licensed county inspectors. Additional treatment monitoring includes quality control checks by PDCP staff using water-sensitive paper. Yellow sheets of water-sensitive paper are placed within the nursery stock shipment at various heights and locations. When the pesticide droplets make contact with the paper, it turns from yellow to blue. After treatment, the sheets are checked to ensure proper coverage. In 2023, PDCP staff placed water-sensitive paper in shipments at each participating nursery a minimum of once a month. Out of 307 water-sensitive papers inspected, 16 indicated the need for retreatment of the shipment.

Bulk Citrus

Citrus trees are primary hosts for GWSS throughout the year. When temperatures are warm, the insects are active and will flee the disturbances associated with harvest. However, once temperatures cool, the sharpshooters 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 2022 through September 2023), live GWSS were found in 3 out of approximately 19,596 certified destination inspections of bulk citrus. The program achieved a success rate of 99.9%. This success is attributed to the cooperative efforts of bulk citrus program participants.

BULK CITRUS REJECTIONS



Citrus harvest and inspections

Area-wide Management Programs

The area-wide management programs coordinate GWSS management efforts in large, agriculturally diverse grape and citrus production areas where GWSS is present.

Approximately 13,600 traps were serviced as part of the program in 2023. GWSS trap finds significantly decreased in the Southern San Joaquin Valley, likely impacted by the increased precipitation and colder winter. Trap finds continue to increase in areas with organic citrus.

MADERA COUNTY

In 2023, 88 GWSS were found in area-wide traps, compared to 71 in 2022. About 352 acres of citrus were treated in 2023.

FRESNO COUNTY

In 2023, 6,348 GWSS were found in citrus and grapes, compared to 15,236 trap finds in 2022. About 218 acres of citrus were treated for GWSS in 2023.

KERN COUNTY

In 2023, 54,818 GWSS were found in area-wide traps, compared to 76,702 trap finds in 2022. About 12,300 acres of citrus were treated for GWSS in 2023.

TULARE COUNTY

In 2023, there were 18,687 GWSS found in area-wide traps, compared to 53,199 in 2022. There were about 4,833 acres of citrus treated in 2023.

RIVERSIDE COUNTY

In 2023, 17 GWSS were found in area-wide traps, compared to 2,010 in 2022. Monitoring occurred in citrus groves and vineyards adjacent to GWSS hot spots in citrus in the Temecula Valley area through June 30, 2023.

BIOLOGICAL CONTROL

The PDCP has been using biological control as a key component of its integrated pest management approach to controlling GWSS since 2001. Biological control is often of greatest value where other control strategies can be problematic, for instance in residential and natural areas where other control options are limited, expensive, and may have undesirable ecological impacts. The incorporation of biological control in the integrated pest management of GWSS has contributed to the eradication of at least 10 of the 18 incipient infestations of GWSS. Biological control has also been utilized in existing partially infested counties in the San Joaquin Valley (Fresno, Kern, Madera, and Tulare) to help prevent the expansion of the boundaries of the infested areas.

GWSS biological control agents are tiny, parasitic wasps (parasitoids). These parasitic wasps are favored as biological control agents due to a short life cycle that allows rapid population increase compared to GWSS, and a very narrow host range so non-targeted insects are unaffected. The female wasps lay their eggs inside GWSS eggs and the immature wasp then completes its development by feeding on the GWSS egg. Once the female adult wasp emerges, it will mate, and search for GWSS eggs to lay more eggs. Through repeated life cycles, the parasitic wasps help increase the overall suppression of GWSS populations.

Since the start of the biological control program, more than 2.85 million biological control agents have been released at agricultural, riparian, and urban sites in 16 counties in California. Two *Cosmocomoidea* species were mass-reared in 2023 by the PDCP (*Cosmocomoidea ashmeadi* and *C. morrilli*) at the CDFA-PDCP Arvin Biological Control Facility in Kern County.

In 2023, a total of 30,279 biological control agents were released at 153 field sites in eight counties (Fresno, Kern, Madera, San Diego, Santa Barbara, Solano, Tulare, and Ventura). This year GWSS biological control agents were continuously released at field sites in Solano County and successful parasitism of GWSS eggs was detected by Solano County officials. Information gained through field monitoring allows us to develop management decisions regarding the value of specific biological control agents in suppressing GWSS in California. Post-release field surveys were conducted by sampling GWSS eggs at the field sites in six counties (Fresno, Kern,



Biological control agents laying eggs inside GWSS eggs



Biological agents emerging from GWSS eggs

Madera, San Diego, Tulare and Ventura). This year the biological control agents that emerged from the samples included *C. ashmeadi*, *C. morrilli*, *C. incompta*, *C. walkerjonesi*, *C. novifasciata*, and *Ufens* spp.

PDCP biological control staff are also responsible for monitoring GWSS populations in Kern County. Every week the number of GWSS eggs, nymphs, and adults are counted at multiple field sites around Bakersfield. This data is used to optimize areawide treatments against GWSS. In 2023, the overwintered GWSS adults appeared to have produced less offspring likely due to the unusually cold and wet weather in spring. In 2023, a total of 122,966 adults were found in Kern County, compared to 46,651 adults in 2022. Notably, nearly 90% of the adults were detected from an area with organic citrus orchard and vineyard where the GWSS activity was newly detected in October 2022 and then GWSS population drastically increased.



C. ashmeadi



C. morrilli



GWSS adults overwintering on a citrus tree

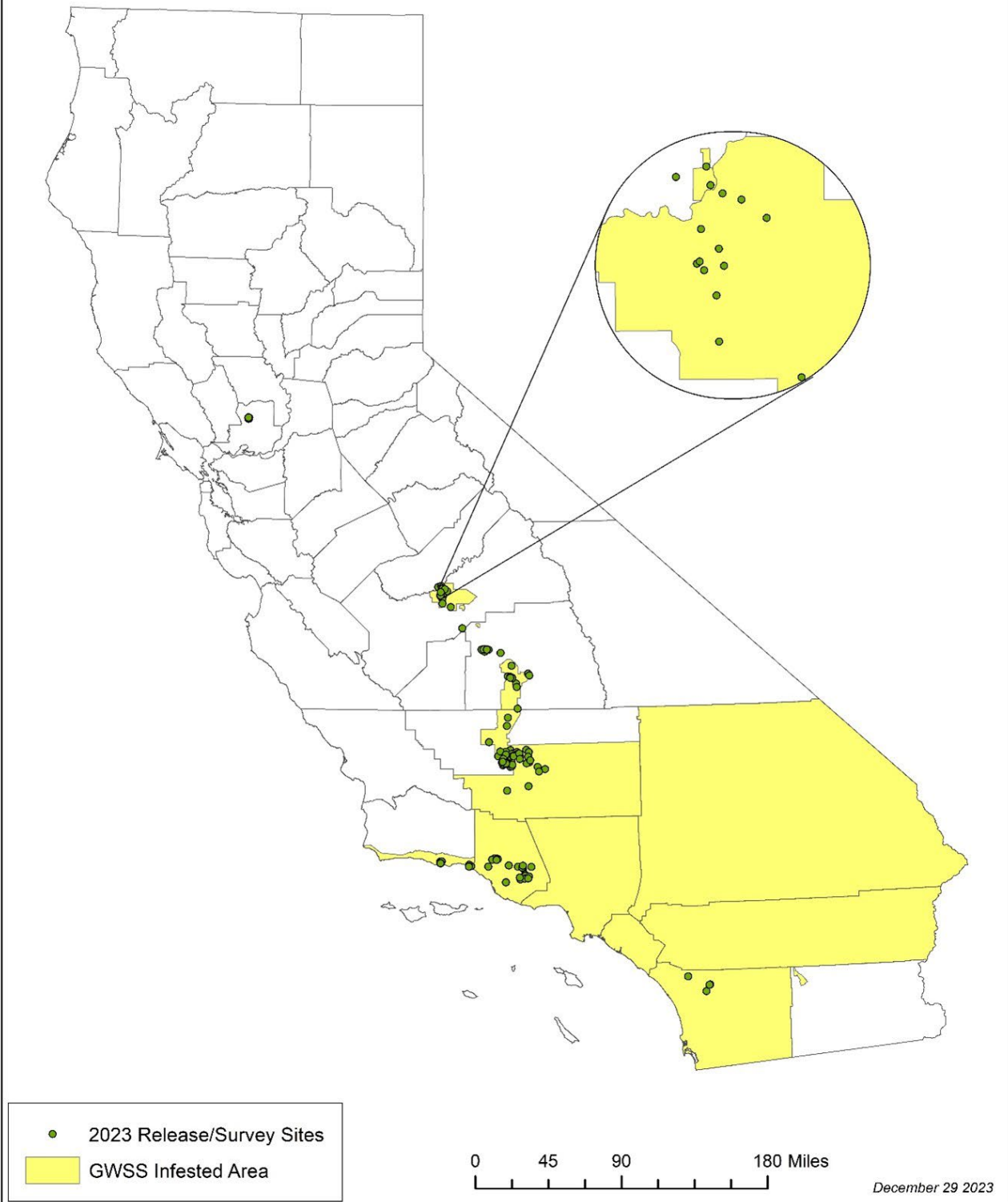
NUMBER OF BIOLOGICAL CONTROL AGENTS RELEASED IN 2023

COUNTY	NUMBER OF SITES	BIOLOGICAL CONTROL AGENTS		TOTAL
		<i>C. ASHMEADI</i>	<i>C. MORRILLI</i>	
Fresno	8	505	1,320	1,825
Kern	38	2,217	7,997	10,214
Madera	2	60	225	285
San Diego	5	630	1,645	2,275
Santa Barbara	14	390	1,050	1,440
Solano	59	1,710	3,480	5,190
Tulare	10	770	3,052	3,822
Ventura	17	1,251	3,976	5,227
TOTAL (2023)	153	7,533	22,745	30,432

GWSS STAGES OBSERVED DURING FIELD-SCOUTING IN KERN COUNTY

YEAR	LIFE STAGES		
	EGG MASS	NYMPH	ADULT
2017	1,784	1,834	18,595
2018	2,412	1,501	27,243
2019	2,277	1,866	33,053
2020	1,823	4,581	47,417
2021	2,751	1,485	29,491
2022	1,502	1,019	46,651
2023	3,689	7,391	122,966

2023 BIOLOGICAL CONTROL SITES



Statewide Survey and Detection

The Statewide Survey and Detection element of the program is designed to locate new GWSS infestations quickly and confirm that non-infested areas remain free of infestation. Activities focus on systematically trapping in urban and residential areas and nurseries to determine if GWSS are present.

Yellow panel traps are deployed in 43 counties that are not infested or are partially infested with GWSS. GWSS are attracted to the trap's bright yellow color and stick to its adhesive surface. County and state personnel service traps regularly during the trapping season. Each trap is checked every second or third week and moved to a new location every six weeks and new traps are used as needed. During the peak of the trapping season, approximately 33,000 traps were deployed and serviced statewide.

In 2023, PDCP staff provided detection training to 367 employees from 45 counties, CDFA, and nurseries. Much of this was done remotely via virtual meeting platforms. Staff conducted quality control inspections of county trapping programs when feasible. These inspections are done to ensure that proper identification of target insects, trap placement, host selection, servicing schedules, and record-keeping are being performed correctly and at the desired levels. Detection and delimitation protocols were updated and distributed to each county participant in spring 2023.



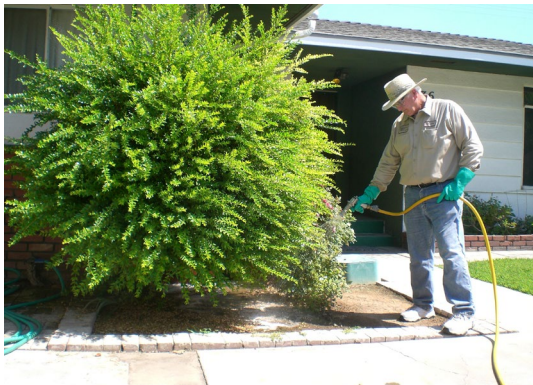
Yellow panel trap



GWSS inspector

Rapid Response

The Rapid Response element of the program involves responding quickly to detections of GWSS in new areas. When GWSS are found in a new area, a delimitation survey is conducted by county biologists, sometimes with assistance from the PDCP. Delimitation surveys consist of high-density trapping and visual inspections of preferred host plants in the area to determine if an infestation is present and, if so, to identify the boundaries. If an infestation is present and treatment is necessary, residents of the area are notified. Treatments in urban and residential areas are applied under the supervision of the county agricultural commissioner and funded by the PDCP. In agricultural settings, treatments are the responsibility of the grower and must be conducted in a manner approved by the county agricultural commissioner.



Soil drench treatment of host material in a GWSS infested area by a pest control operator

In 2023, eradication or suppression efforts continued in the infested portions of Fresno, Madera, Solano, and Tulare counties. Statewide, approximately 4,212 (infested and adjacent) properties were treated.

Eradication efforts in the Vacaville area of Solano County remain a priority for the PDCP. Solano County's public outreach has been crucial to the success of the eradication efforts of GWSS in the

Vacaville area. Solano County provided 912 foliar and/or soil treatments to 872 properties in 2023. The county plans to continue to monitor their 200+ traps during the winter months.

Despite Solano's success with treatments, the county's diligent detection and survey efforts yielded additional GWSS finds in 2023. County staff found a total of 13 adults, six nymphs, and 213 egg masses, none of which were confirmed to be viable. Some parasitized egg masses have been observed in the area, demonstrating that the biological control agents released by PDCP caused them to perish. The finds did not



result in an expansion of the original infested area boundaries. The PDCP remains hopeful that the eventual eradication of the Vacaville area will be possible with the continued support of the local residents.

Pre-Treatment Communication with Residents of Treatment Areas

Extensive public outreach and communication activities are conducted to ensure residents in affected areas are kept well informed of program and treatment activities.

A public meeting or other outreach activity for community members precedes treatment in urban and residential areas. This provides residents the opportunity to learn about and discuss the treatment process with agricultural officials and environmental health specialists. Door-to-door contacts, direct mail, and/or local media are used to inform residents of public meetings. Consenting occupants of all properties scheduled for treatment are given advance notification of the treatment date and time, information on the material to be used, and a phone number to call for more information. In 2023, residents in the proposed treatment areas were invited to participate in virtual public meetings.

To help protect local wildlife, a database of threatened and endangered species is consulted to determine if any listed species are present in the treatment area. All appropriate federal and state agencies are notified before treatment.

Treatment

Public safety is CDFA's number one concern whenever treatments are applied. PDCP staff and cooperators ensure that only registered materials are applied, in strict compliance with labels and other restrictions.

Treatment Monitoring

The Environmental Monitoring Branch of the California Department of Pesticide Regulation (CDPR) monitors pesticide treatments to determine resulting residue levels. This information is used by the PDCP to assess application rates and coverage. Sampling results and related monitoring reports are available on the CDPR's website at <https://www.cdpr.ca.gov/docs/emon/ehap.htm>.

Outreach and Education

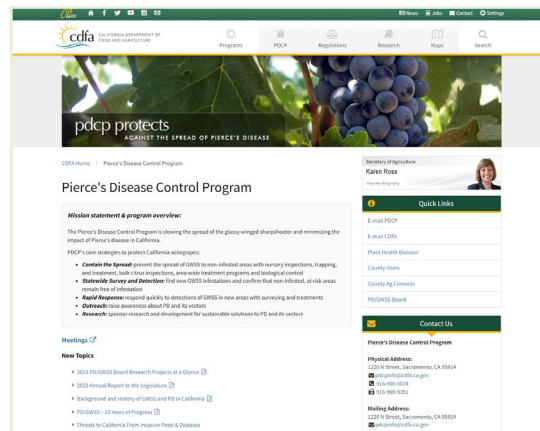


County Agricultural Commissioner Outreach Activities

In 2023, local county agricultural staff and industry members played key roles in maintaining program visibility and stakeholder awareness. County public outreach and education efforts included the distribution of PD and GWSS informational material to local retail, production, and shipping nurseries, as well as landscape companies, members of the grape growing community, and others. Industry trade publications, cooperative extension newsletters, and media interviews also proved to be successful methods of outreach. Some counties also participated in continuing education seminars and conducted training for landscapers, pest control operators, nursery employees, and nursery association members.

Website

CDFA hosts a website for the PDCP featuring information on program activities, survey guidelines, regulatory guidelines, announcements of upcoming meetings and events, the GWSS host list, and other information. In addition, the website provides an interactive interface that allows direct activity reporting by local entities. This website is www.cdffa.ca.gov/pdcp and is effective for providing current and reliable information to interested parties. This year, an audit of the PDCP website was conducted to review content and navigation and improvements were made to improve the user experience.



PDCP website homepage

Pierce's Disease and Glassy-winged Sharpshooter Board's Outreach Program

The focus of the PD/GWSS Board's outreach and education program is sharing information, research advancements, and actionable recommendations for designated pests and diseases of winegrapes so growers see a return on their

investment in the annual Pierce’s Disease Assessment. While leading scientists work toward finding solutions to PD and other serious winegrape pests and diseases, growers can learn from research results and apply new techniques and strategies directly in the field.

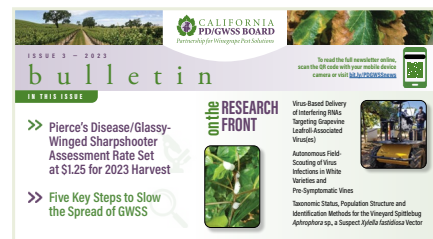
Strategies for the outreach and education program in 2023 included:

- Informing audiences of ongoing activities and successes in the search for solutions to PD and its vectors;
- Informing audiences of ongoing activities and research efforts addressing other designated pests and diseases of winegrapes;
- Sharing information and news on pest detections, rapid responses, and other containment efforts;
- Sharing information on how the industry assessment and federal funds have been used to protect the California winegrape industry from designated pests and diseases; and
- Promoting the PD/GWSS Board’s capacity to leverage grower-committed funding by drawing down state and federal governmental support.

A solid, consistent, and strategic communications approach speaks to the sensibilities of growers, and a variety of communication vehicles are utilized to reach them in the most appropriate, cost-effective, and convenient manner.

The following communications activities were used to connect with growers and other industry partners in 2023:

- **Quarterly Newsletter and Postcard:** An online-only quarterly newsletter highlights PD/GWSS Board actions, research advances, and research project reports. A companion postcard, with newsletter headlines and photographs, is mailed to over 7,000 winegrape growers, industry stakeholders, and elected officials, with a URL and QR code inviting readers to view the full newsletter online.



Summer 2023 postcard

Issues can be viewed online at cdfa.ca.gov/pdcp/newsletters.html.

Top feature stories in 2023 included:

- » Advancing Biopesticide Technologies for Managing Pierce’s Disease: bit.ly/3TT2XVK
- » Meet the New Pierce’s Disease Control Program Statewide Coordinator: bit.ly/42000mr

- » PD/GWSS Board Strengthening its Grapevine Virus Research Strategy: bit.ly/3TYuHlP
- » PD/GWSS Board Grants \$2.7 Million in New Funding for Research Projects: bit.ly/3NqVUZL
- » Pierce's Disease Found in Humboldt County: bit.ly/3Sg6BYv
- » Five Key Steps to Slow the Spread of the Glassy-Winged Sharpshooter: bit.ly/47tvRAc
- » PD/GWSS Assessment Rate Set at \$1.25 for 2023 Harvest: bit.ly/48OEWn1
- » California Strengthens Defenses as Spotted Lanternfly Continues to Spread in Eastern States: bit.ly/480xlfq
- » Accelerating Research on Grapevine Viruses: bit.ly/3tSziBs



Winter 2023 newsletter

- **Monthly E-newsletter:** Shares PD/GWSS Board activities, PDCP reports on containment and treatments, and relevant media coverage. The monthly e-newsletter is sent to over 1,200 winegrape growers and industry stakeholders, with a 45% average open rate. Readers clicked on included links 630 times.
- **Website:** Provides comprehensive information on the PD/GWSS Board, PD/GWSS winegrape assessment, pests and diseases designated by the PD/GWSS Board, and research projects funded by the PD/GWSS Board. Visit the website at https://www.cdfa.ca.gov/pdcp/PD_GWSS_Board.html.
- **Research at a Glance:** Published the “2023 PD/GWSS Board Research Projects at a Glance,” showcasing pivotal work from the past year to combat winegrape pest and disease challenges. The 2023 report presents the results of 30 projects, underscoring pioneering discoveries, effective practices, and valuable industry recommendations. The report is available online at bit.ly/PDRResearchProjects23.
- **Industry Tradeshows:** Participated in three industry tradeshows, engaging with growers and industry colleagues at in-person events on the North Coast, Central Coast and Central Valley. Event attendees who stopped by the booth were most interested in learning more about the PD/GWSS Board’s research program, the GWSS infestation in Solano County, and spotted lanternfly.
- **Spotted Lanternfly Outreach Campaign:** Continued a print and digital advertising campaign in English and Spanish to raise awareness of the invasive pest. The advertisements feature photographs of the spotted lanternfly life stages and the time of

year to look for them. The digital assets are available for download at bit.ly/3vT3p9b and were shared with winegrape grower associations, county agricultural commissioners, and other industry partners to add to their websites and educational materials. Print ads ran five times in industry publications and online ads ran three times in one winegrape industry media website. Social media advertising reached over 773,000 people in 2023, with 2.3 million impressions and over 9,000 people clicked through to the PD/GWSS Board's spotted lanternfly webpage for more information.



Spotted lanternfly digital advertisement

- **Social Media:** Shared PD/GWSS Board news, research advancements and applications, and relevant media coverage through Facebook, YouTube, and LinkedIn. The PD/GWSS Board Facebook page (<https://www.facebook.com/PDGWSSBoard>) has over 390 followers, a 22% increase since last year, and reached over 695,000 people. The PD/GWSS Board YouTube channel (<https://www.youtube.com/@PD-GWSS-Board>) has 65 subscribers, an 8% increase since last year, and videos were viewed over 2,000 times with over 66 hours of watch time. Newly launched this year, the PD/GWSS Board LinkedIn page (<https://www.linkedin.com/company/pd-gwss-board>) has 25 followers and content garnered over 630 impressions.
- **Media Outreach:** Maintained regular relations with key wine and agricultural media to keep them apprised of story opportunities, research successes, and PD/GWSS Board activities; provided background information and images to assist media in accurately reporting PD/GWSS Board news and research. In 2023, there were 18 news articles mentioning the PD/GWSS Board, including reporting on the annual assessment rate, research funding, research projects and advances, the threat of PD and GWSS, the grapevine viruses research review with the National Academies of Science, and the new PDCP statewide coordinator.

Research

Research continues to be an integral part of the PDCP. In 2023, the flurry of research activity on PD and its vectors that began at the start of the program continued, with approximately 19 active projects led by some of the nation's top plant health researchers. Projects ranged from lab-based investigations at the molecular and genomic levels to field trials in experimental and commercial vineyards. In late 2023, an economic study began to re-evaluate the economic impacts of PD and the PDCP which was last investigated a decade prior. The information being generated provides valuable insight into the biology, ecology, and behavior of PD and its vectors. Additionally, 16 projects on other PD/GWSS Board-designated pests and diseases of winegrapes were in progress in 2023, increasing the knowledge base available for developing management solutions. This included support for virus testing by the University of California Foundation Plant Services in Davis as they move their critically important grapevine foundation nursery stock to greenhouses in response to the threat of grapevine viruses.



2023 RESEARCH FUNDING

\$2.7M
in new funding
for 17 projects

\$1M
for 10
continuing projects

\$55M
invested in research
since 2001

CALIFORNIA PD/GWSS BOARD
Partnership for Winegrape Pest Solutions

This extensive and sustained research effort has yielded discoveries and approaches that show good potential for leading to solutions. These include using conventional plant-breeding methods to develop grapevines resistant to PD, using non-pathogenic microorganisms to fight, displace, or out-compete pathogenic *Xf* strains, identifying the mechanisms and processes

leading to bacterial infection and spread, uncovering methods to prevent GWSS from being able to vector *Xf*, and elucidating the biochemical pathways that result in disease symptoms and death. Scientists have developed plant metabolites that block damage-causing pathways and processes and are experimenting with ways to introduce them into the plants via specially developed rootstocks, topical applications, and other means. Field testing of grapevine plant material developed

using transgenic approaches began in 2010 and continued through 2023. A collection of project summaries was compiled in 2023 and is available on the program’s website here: <https://www.cdfa.ca.gov/pdcp/research.html>.

In 2023, the PD/GWSS Board’s research coordinator continued to review, guide, and facilitate the PD/GWSS Board’s research funding program. They are working to ensure the industry is getting the best research investment from their assessment dollars.

The end of 2023 marked the midpoint of a PD/GWSS Board-funded agreement with NAS to conduct a comprehensive review of its grapevine viruses research program. The first year of the project included several public webinars and listening sessions, an assessment of the PD/GWSS Board’s process for reviewing and selecting research proposals to fund, and a review of proposals received for new funding. Recommendations from the NAS committee are already being implemented, such as revisions to the Board’s annual request for proposals. The committee will continue to review current knowledge on grapevine red blotch virus and grapevine leafroll-associated virus type 3, research outcomes and gaps, and approaches for future research in 2024. The final report will guide the PD/GWSS Board’s strategy for research funding. The PD/GWSS Board conducted a similar review with NAS focused on PD and GWSS in 2004, which paved the way for many of the PD research successes over the past two decades.

Research Proposal Solicitation and Review

In 2023, the PDCP joined other CDFA grants programs in using a new department-wide grants portal to facilitate its research and outreach proposal solicitation and review process, while the PD/GWSS Board’s research coordinator worked with expert scientific reviewers to evaluate the proposals. The annual request for proposals invites proposals on PD, its vectors, and other designated serious pests and diseases of winegrapes.

A total of 31 proposals were received and reviewed, with 17 proposals totaling over \$2.7 million over the next three years selected for funding using California PD/GWSS winegrape assessment funds. In addition, 18 ongoing projects were approved to continue for another fiscal year including some receiving no-cost extensions.

Environmental Compliance

In 2023, the CDFA continued its efforts to ensure that PDCP's activities are conducted in an environmentally responsible manner. These efforts included holding public meetings in advance of treatment activities, adhering to a special notification and consultation process with federal and state environmental stewardship agencies before treatment, and ensuring that pesticide applications are performed by licensed pest control professionals in strict accordance with California pesticide laws and regulations.



Licensed pest control professional performing pesticide applications

CDFA remains committed to fulfilling its legislative mandate to prevent the spread of harmful pests while complying with the California Environmental Quality Act to ensure the protection of agriculture, the environment, and other natural resources. The PDCP and CDFA plan to continue to revise the previous statewide programmatic environmental impact report in 2023.

Financial Statement

Industry Fund (PD/GWSS Board Winegrape Assessment)

REVENUE

FY 2022-23 (ACTUAL)	FY 2023-24 (PROJECTED)
\$4,601,164	\$5,208,000

EXPENDITURES

EXPENDITURE TYPE	FY 2022-23 (ACTUAL)	FY 2023-24 (PROJECTED)
Personnel Services	\$17,450	\$362,260
Operating Expenses	\$274,550	\$190,740
Research and Outreach	\$3,440,242	\$4,288,563
County Payments	\$1,189,548	\$2,100,000
TOTAL EXPENDITURES	\$4,921,790	\$6,941,563



Other Funds

REVENUE

REVENUE SOURCE	FY 2022-23 (ACTUAL)	FY 2023-24 (PROJECTED)
Federal (United States Department of Agriculture)	\$15,574,754	\$15,574,754
CDFA (Emergency Fund)	\$594,733	\$596,595
TOTAL REVENUE	\$16,169,487	16,171,349

EXPENDITURES

EXPENDITURE TYPE	FY 2022-23 (ACTUAL)	FY 2023-24 (PROJECTED)
Personal Services	\$4,014,280	\$4,000,000
Operating Expenses	\$1,842,435	\$2,046,325
County Payments	\$11,296,534	\$11,672,277
TOTAL EXPENDITURES	\$17,153,249	\$17,718,602