



S U M M E R 2 0 2 0

bulletin



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

INSIDE THIS ISSUE

\$2.4 Million Approved for Research and Outreach Projects

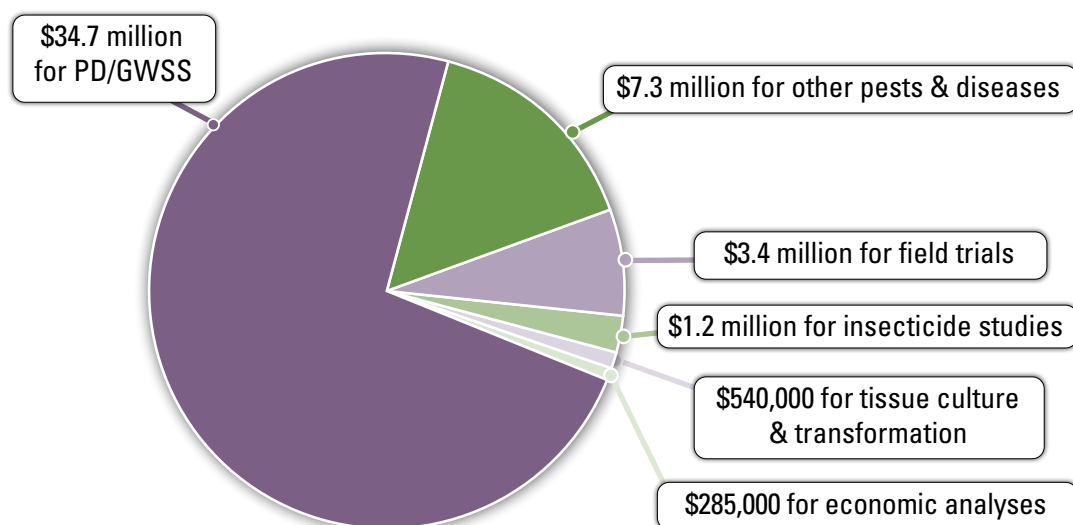
The Pierce's Disease and Glassy-Winged Sharpshooter (PD/GWSS) Board recommended funding 12 research and outreach projects on PD, GWSS, and other designated pests and diseases of winegrapes at its April meeting.

The projects will run from one to three years, with \$2.4 million in total funding. The Board's recommendation was approved by California Department of Food and Agriculture Secretary Karen Ross.

The funding recommendation followed a rigorous review by the Board's Research Screening Committee and scientific review panels of the 17 proposals that were submitted in response to the Board's annual request for proposals, as well as one out-of-cycle proposal. In addition to the 12 new grants scheduled to begin in the new fiscal year (see next page for project list), nine projects previously approved by the Board will continue as planned in fiscal year 2020-21.

The Research Screening Committee met in May to discuss research priorities for next year's request for proposals. "Given the increasing importance of grapevine virus diseases, the Board would like to see more virus-related proposals submitted in future years," said Steve McIntyre, chair of the committee.

Since 2010, the Board has had the authority to use funds collected through the PD/GWSS winegrape assessment for research and outreach on other winegrape pests and diseases. Projects funded in this cycle on other designated pests and diseases include research and outreach on grapevine red blotch virus, grapevine leafroll virus, and mealybug pests of winegrapes.



PAGE 2

List of Newly Funded Research Projects

PAGE 3

On the Research Front

- Transgenic rootstock-mediated protection of grapevine scion by introduced single and dual stacked DNA constructs
- Resistance to grapevine leafroll-associated virus 3 and the grape mealybug
- Identification of grape cultivars and rootstocks with resistance to vine mealybug

PAGE 4

Growers Vote to Extend PD/GWSS Assessment Through 2026

- Passed with 78 percent approval
- 2020 assessment rate set at \$1.00

Research Proposals Beginning in 2020-2021

Topic	Title	Project Leader	Total Funding*
Pierce's Disease Field Trials	Management of the federal permits for multi-investigator field-testing of transgenic grapevine rootstocks in California	A. Dandekar, UC Davis	\$114,653
Pierce's Disease Field Trials	Transgenic rootstock-mediated protection of grapevine scion against Pierce's disease by dual stacked DNA constructs	D. Gilchrist, UC Davis	\$436,700
Pierce's Disease/Glassy-Winged Sharpshooter	Development of a gene editing technology for grapevines using plant protoplasts	D. Tricoli, UC Davis	\$91,866
Pierce's Disease/Glassy-Winged Sharpshooter	CRISPR-mediated genome modification of <i>Homalodisca vitripennis</i> for the genetic control of Pierce's disease	P. Atkinson, UC Riverside	\$558,816
Pierce's Disease & Viruses	Comparative field infection and disease development of the two most important grapevine vector-borne pathogens, <i>Xylella fastidiosa</i> and grapevine leafroll-associated virus 3	R. Almeida, UC Berkeley	\$170,338
Vine Mealybug	Genomics based technology for identification, tracking, insecticide resistance surveillance, and pest management of vine mealybug in vineyards	L. Burbank, USDA-ARS	\$122,615
Vine Mealybug	Evaluation of <i>Vitis</i> rootstocks with partial resistance to vine mealybug	R. Naegele, USDA-ARS	\$48,502
Grapevine Red Blotch Virus	Developing a GMO-free RNA interference approach to mitigate red blotch negative impacts on grape berry ripening	L. Deluc, Oregon State University	\$46,970
Grapevine Red Blotch Virus	Ecology of grapevine red blotch-associated virus	Marc Fuchs, Cornell University	\$225,388
Grapevine Red Blotch Virus	Structure-function studies on grapevine red blotch virus to elucidate disease etiology	C. Rock, Texas Tech University	\$131,033
Grapevine Red Blotch Virus	Monitoring grapevine red blotch virus at Russell Ranch Foundation Vineyard	M. Al Rwahnih, UC Davis	\$166,714
Insects & Viruses	Resistance to grapevine leafroll virus 3 and its major mealybug vectors	M. Fuchs, Cornell University	\$296,292

* Grant durations will be one to three years.

on the RESEARCH FRONT



CALIFORNIA PD/GWSS BOARD

Partnership for Winegrape Pest Solutions



Field trial of Chardonnay scions grafted on PD-resistant modified rootstocks

Transgenic Rootstock-Mediated Protection of Grapevine Scion by Introduced Single and Dual Stacked DNA Constructs

Principal Investigators: David Gilchrist, James Lincoln, and Abhaya M. Dandekar, University of California, Davis

Earlier experiments yielded five different DNA constructs that protected grapevines against Pierce's disease (PD) compared to unmodified vines. This current field experiment is testing potential cross-graft protection of PD-susceptible Chardonnay scions grafted to two modified rootstocks (1103 and 101-14) that expressed paired combinations of the five transgenes. Plants will be trained to commercial standards, inoculated with *Xylella fastidiosa*, and evaluated for bacterial infection, PD symptoms, and yield.

Identification of Grape Cultivars and Rootstocks with Resistance to Vine Mealybug

Principal Investigator: Rachel P. Naegele, USDA Agricultural Research Service, Parlier

Vine mealybug-resistant rootstocks could provide sufficient control either alone or in combination with insecticides. Two potential sources of resistance to vine mealybug have been identified in lab and outdoor tests using potted grapevines. This project continues to identify sources of resistance to vine mealybug and evaluate these materials for their effect on mealybug overwintering and survival. In this current project, the team evaluated one additional rootstock (Freedom) and confirmed the susceptibility/resistance of select rootstocks and cultivars in a greenhouse setting. In the short term, these materials may be used as rootstocks to reduce mealybug populations on susceptible commercial cultivar scions. In the long term, project findings can facilitate breeding mealybug resistance into commercial grape cultivars.



Vine mealybug and ants on a susceptible scion



Dissected gut and filter chamber of a grape mealybug

Resistance to Grapevine Leafroll-Associated Virus 3 and the Grape Mealybug

Principal Investigators: Marc Fuchs, Angela Douglas, and Greg Loeb, Cornell University

Using RNA interference (RNAi), the team has made progress in developing grapevines resistant to grapevine leafroll-associated virus 3 (GLRaV-3), the dominant leafroll virus in diseased vineyards, and to the grape mealybug and vine mealybug, the two most important mealybug vectors of GLRaV-3. Target genes for RNAi against grape mealybug were identified and showed significantly increased mortality of the insects. The team is now designing RNAi that will be efficient against both mealybug species. The production of grape plants stably transformed with RNAi constructs against GLRaV-3, grape mealybug, and vine mealybug is also underway.

Growers Vote to Extend PD/GWSS Assessment Through 2026

The Pierce's Disease & Glassy-Winged Sharpshooter (PD/GWSS) Referendum, conducted this spring, passed with 78 percent approval of California winegrape growers. All winegrape producer entities that paid the assessment on grapes crushed in 2019 received ballots and 49 percent cast ballots. Assessment funds are used for research, outreach, and related activities on PD, GWSS, and other designated pests and diseases of winegrapes.

"It is heartening to know that California's winegrape growers continue to see value in the joint effort that we've built together with the assessment," said CDEA Secretary Karen Ross. "Our growers know and understand the importance of research, and – just as importantly – they recognize the value of their ongoing investment in this exemplary partnership between industry and government."

The PD/GWSS Board advises the CDEA on the use of winegrape assessment funds. The Board has invested over \$47 million since 2001 on research and outreach. The Board sets the annual assessment rate, with a maximum of \$3.00 per \$1,000 of value. The annual assessment rate has averaged \$1.39 per \$1,000 of value and has been set at \$1.00 for 2020.

"In these trying times, we appreciate the support of the industry in passing this referendum," said Domonic Rossini, PD/GWSS Board chair. "The PD/GWSS Board is always focused on growers' best interests and ensuring our industry has the best research at its back to protect California vineyards from pests and diseases."

The PD/GWSS Referendum is conducted every five years by law, and will take place again in 2025. Through the renewal of the assessment, growers' continued commitment to the industry and government partnership led by the statewide Pierce's Disease Control Program leverages funding for essential activities, including:

- Research
- Maintaining and monitoring GWSS traps
- Conducting nursery stock shipment inspections
- Overseeing nursery stock treatments
- Controlling GWSS using area-wide management programs
- Operating a biological control program to suppress GWSS populations