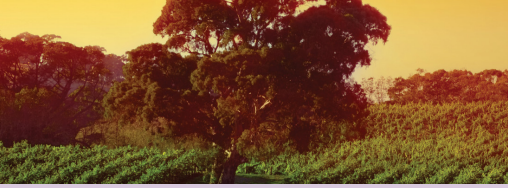


CALIFORNIA
PD/GWSS BOARD
Partnership for Winegrape Pest Solutions

WINTER 2020

bulletin

cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

INSIDE THIS ISSUE

Plant Patents Filed for First Pierce's Disease-Resistant Winegrapes

California winegrape growers will soon have a powerful new tool in the fight against Pierce's disease (PD)–five grapevine varieties resistant to the disease. The PD-resistant grapevines, three red and two white, were developed through traditional breeding methods over the past 20 years by Dr. Andrew Walker at the University of California, Davis, with funding from the Pierce's Disease and Glassy-Winged Sharpshooter (PD/GWSS) Board.

Dr. Andrew Walker with a PD-resistant grapevine.

"Without the long-term funding from the PD/GWSS Board, the grape breeding program wouldn't be where it is today. We would still be years away from bringing PD-resistant grapevines to market," said Dr. Walker. "We'll continue to expand the breeding program, with a focus on multiple sources of PD resistance and powdery mildew resistance, while maintaining excellent wine quality."

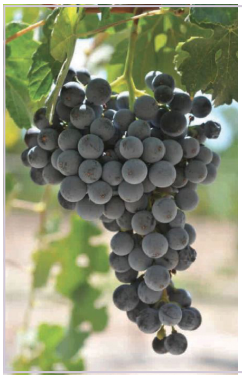
Dr. Walker created the new varieties by crossing *Vitis arizonica*, a grapevine species from the southwestern U.S. and northern Mexico which carries a single dominant gene for resistance to PD, over four to five generations with *Vitis vinifera,* the European winegrape species that is typically grown in California.

The varieties have undergone extensive evaluations in the greenhouse and in field locations, including test sites in Napa, Sonoma, Riverside, and Ventura County in California, as well as in Texas, Alabama, and Florida. They produce high-quality fruit and wine, and have been evaluated by sensory tasting panels. (*See profiles of each selection on the next page.*)

The PD/GWSS Board has invested over $34.3 million in research since 2001 to find solutions to PD, including funding Dr. Walker's work. "Delivering PD-resistant grapevines to California winegrape growers has long been a goal of the PD/GWSS Board," said Keith Horn, board chairperson. "These new vines are our strongest products yet in the ongoing battle to protect vineyards from this fatal disease, giving growers greater flexibility and enabling them to get the most out of valuable vineyard property that otherwise might need to be replanted over and over. Our congratulations and thanks to Dr. Walker and his team for this noteworthy accomplishment."

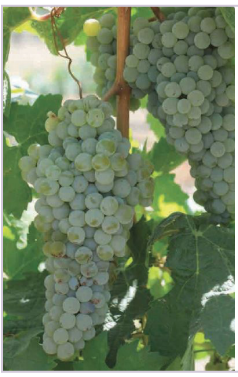
These five varieties are ready for patenting and release. There will be limited amounts of plant material available for propagation in 2020, but more is expected to be available in 2021. The PD-resistance breeding program continues and more selections are approaching release.

Profiles of New PD-Resistant Winegrapes



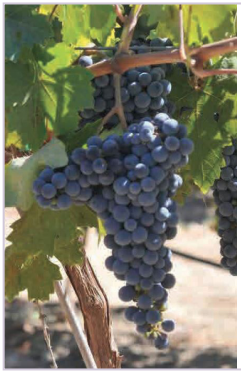
Camminare Noir (Selection 07355-075)

- 50% Petite Sirah and 25% Cabernet Sauvignon
- ***Bloom:*** early
- ***Ripening:*** early
- ***Berries:*** large
- ***Clusters:*** medium large
- ***Productivity:*** medium



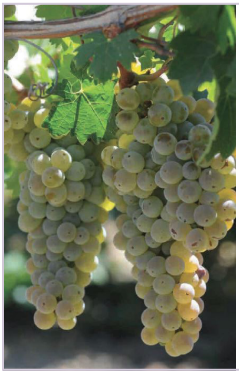
Ambulo Blanc (Selection 09314-102)

- 62.5% Cabernet Sauvignon, 12.5% Carignane, and 12.5% Chardonnay
- ***Bloom:*** early
- ***Ripening:*** early
- ***Berries:*** small to medium
- ***Clusters:*** medium large
- ***Productivity:*** high



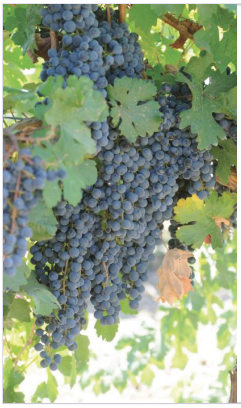
Paseante Noir (Selection 09331-047)

- 50% Zinfandel, 25% Petite Sirah, and 12.5% Cabernet Sauvignon
- ***Bloom:*** late
- ***Ripening:*** mid-season
- ***Berries:*** large
- ***Clusters:*** large
- ***Productivity:*** moderate-low



Caminante Blanc (Selection 09338-016)

- 62.5% Cabernet Sauvignon, 12.5% Chardonnay, and 12.5% Carignane
- ***Bloom:*** late
- ***Ripening:*** mid-season
- ***Berries:*** small
- ***Clusters:*** small
- ***Productivity:*** medium



Errante Noir (Selection 09356-235)

- 50% Sylvaner, and 12.5% each of Cabernet Sauvignon, Carignane, and Chardonnay
- ***Bloom:*** mid-season
- ***Ripening:*** mid-season
- ***Berries:*** large
- ***Clusters:*** loose medium
- ***Productivity:*** high

PD/GWSS Referendum Ballots Coming Soon

Producers who paid the Pierce's Disease and Glassy-Winged Sharpshooter Assessment on winegrapes from the 2019 harvest will soon vote on extending the assessment for another five years. Ballots are expected to be mailed in March or April, and there will be a 30-day voting period.

Growers who operate multiple entities will receive a separate ballot for each entity. Each ballot should be voted and returned. At least 40 percent of the eligible voting entities must cast ballots for the referendum to be valid. Additionally, passage of the referendum requires one of the following:

1. At least 65 percent of those voting, representing a majority of assessments paid by those who voted, vote "yes," OR
2. A majority of those voting, representing at least 65 percent of the assessments paid by those who voted, vote "yes."

Voting results will be announced mid-June. Last time growers voted, over 80 percent favored the continuation of the assessment. The assessment funds research and other activities related to PD, as well as research and outreach on other designated pests and diseases of California winegrapes.

on the RESEARCH FRONT

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Spray applications of ***Paraburkholderia phytofirmans*** provide high levels of disease control.

Optimizing Biological Control of Pierce's Disease with *Paraburkholderia phytofirmans*

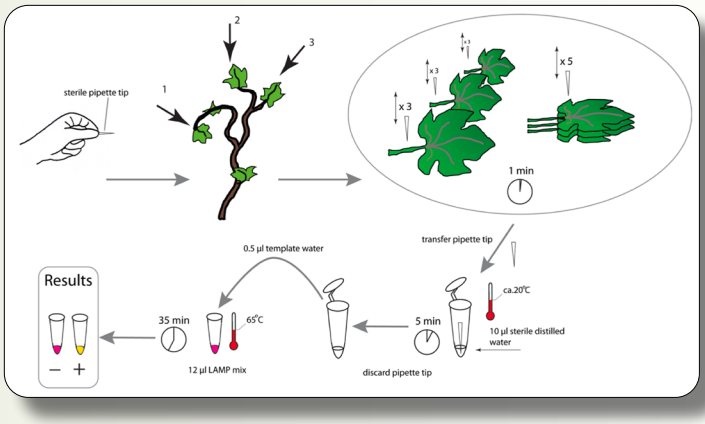
Project leader: Steven Lindow, University of California, Berkeley

Continued field trials show the bacterium *P. phytofirmans* to be very effective in controlling *Xylella fastidiosa (Xf)*. The team evaluated the ideal timing and frequency of applications of the biological control agent and learned that a limited number of applications should be sufficient to achieve high levels of disease control in the field. Spray inoculations continue to be among the best and most practical method of application. Given that this well-studied biological control agent is a naturally occurring strain recognized as a beneficial organism, the regulatory requirements for its commercial adoption should be relatively modest.

Ecology of Grapevine Red Blotch Virus (GRBV)

Project leaders: Marc Fuchs and Keith Perry, Cornell University

Current GRBV management strategies require accurate detection of GRBV so that infected vines can be identified and removed. Ideally, testing for GRBV should be inexpensive, rapid, user-friendly, and performed on-site with minimal training. The team developed a loop-mediated isothermal amplification (LAMP) assay to detect GRBV on-site and successfully tested it with two vineyard operations in summer 2019.



Flowchart of the steps involved in the pin-prick GRBV LAMP assay.

The method the team uses for expressing proteins in grapevines in the lab.

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

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

More control strategies for grapevine leafroll-associated virus(es) and mealybugs are needed, given the lack of natural resistance in *Vitis vinifera* grapevines and challenges in developing disease-resistant vines by conventional breeding. The research team is modifying two grapevine viruses to be non-pathogenic viral vectors and will attempt to use them to protect grapevine rootstocks and scions using RNA interference. This project will provide new important information and contemporary strategies to incorporate into existing management approaches.

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.

What's Driving Increased Pierce's Disease Activity on California's North Coast?

With periodic outbreaks of Pierce's disease (PD) on the North Coast and the disease showing up in vineyards in unexpected patterns, researchers have been investigating biological and environmental factors to gain new perspectives to aid growers.

Historically, new infections of PD in Napa and Sonoma counties have been attributed to the native blue-green sharpshooter (BGSS) overwintering in riparian areas and bringing *Xylella fastidiosa (Xf)*, the bacterial cause of PD, into vineyards the following spring. New findings point to the potential for inter-annual secondary spread in vineyards, as well as spittlebugs acting as additional disease vectors.

Data from the past few years suggests the sharpshooters arrive in the vineyard in the spring without Xf. They then acquire *Xf* while in the vineyard and spread it to other vines throughout the summer before returning to riparian corridors for winter. While proximity to riparian areas is still an important factor in PD management, infected vines within vineyards can also contribute to disease spread and should be removed. The available data indicates that severe pruning is ineffective.

Warmer temperatures during both dormant and growing seasons also appear to be making the BGSS more efficient at spreading *Xf*. For the BGSS population, warmer temperatures are causing higher feeding rates, quicker development, improved overwinter survival, and improved transmission efficiency of *Xf*. Warmer temperatures are also increasing the spread of *Xf*, with more rapid disease onset and decreased chance for vines to recover over the winter.

The research team surveyed vineyards and riparian areas on the North Coast.

While sharpshooters are the most common vector of PD, spittlebugs are also playing a role in spreading the disease in North Coast vineyards. The research team found spittlebugs on grasses and weeds along roads and ditches on vineyard edges, with larger populations on shortpod mustard and curly dock.

The research team includes: Rodrigo Almeida, Paul Fine, and Alexander Purcell, University of California, Berkeley; Matt Daugherty, University of California, Riverside; Monica Cooper, University of California Cooperative Extension, Napa County; and Rhonda Smith and Lucia Varela, University of California Cooperative Extension, Sonoma County.

Read more about the research at piercesdisease.cdfa.ca.gov/projects/386 and in the December 2019 issue of Wine Business Monthly, available online at https://bit.ly/2R001Vg.