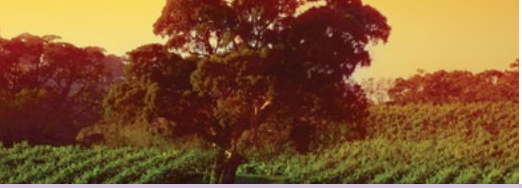

CALIFORNIA
PD/GWSS BOARD
Partnership for Winegrape Pest Solutions

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bulletin

cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

INSIDE THIS ISSUE

What To Do With Tree-of-Heaven Near Vineyards

The most common host of the invasive pest spotted lanternfly is the tree-of-heaven (*Ailanthus altissima*), an invasive and rapidly growing deciduous tree common to urban, suburban, and agricultural areas, and along roadsides and railways.

The tree-of-heaven grows almost anywhere and can be difficult to control.

Tree-of-heaven can be difficult and expensive to remove or control but having them near vineyards could put grapes at risk should the spotted lanternfly become established in California. Growers can take a two-pronged approach to protect their grapes against this pest threat: (1) look for spotted lanternfly and report finds to the California Department of Food and Agriculture Pest Hotline at 1-800-491-1899 or online at cdfa.ca.gov/go/reportapest, and (2) remove tree-of-heaven near vineyards, if feasible.

The tree-of-heaven's smooth bark resembles the skin of a cantaloupe, turning from brownish-green to light brown to gray as the tree matures.
Photos by: Annemarie Smith, ODNR Division of Forestry, Bugwood.org

The tree-of-heaven grows almost anywhere and can be difficult to control due to its extensive root system and resprouting ability. It grows in dense colonies with full-grown trees reaching up to 80 feet tall and up to six feet in diameter. Identifying characteristics include smooth bark resembling the skin of a cantaloupe that is brownish-green when young and turns light brown to gray as it matures; leaves have a central stem with leaflets attached on each side, and seeds grow in clusters of one-to-two-inch-long samara or wing, which hang on the tree through winter.

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Scout your area for tree-of-heaven and remove it if practical. Cutting and mowing alone are ineffective, as it prompts the tree to produce large numbers of stump sprouts and root suckers. Established trees continually send up root suckers that may emerge as far as 50 feet from the parent tree, even if cut or injured.

Treat the trees with systemic herbicides in mid-to late-summer and then cut down the trees a month later. Repeated efforts and monitoring are key to successfully removing well-established tree-of-heaven stands. Learn more about tree-of-heaven identification and management at extension.psu.edu/tree-of-heaven and management of tree-of-heaven in California at bit.ly/39b9pSQ.

Tree-of-heaven leaves have a central stem with leaflets attached on each side and seeds grow in clusters of one-to-two-inch-long samaras, or wings.
Photo by: Barbara Tokarska-Guzik, University of Silesia, Bugwood.org

The spotted lanternfly has spread to 11 states in the Northeastern United States. The insect pest is a threat to many important commercial crops, especially grapevines, and affects people's enjoyment of the outdoors. While infestations haven't been found in California, the spotted lanternfly is a good hitchhiker, clinging to or laying egg masses on vehicles, trucks, trains, and outdoor items, and California is an ideal habitat for the pest. Learn more at cdfa.ca.gov/pdcp/slf.

While spotted lanternfly eggs look like splashes of dried mud, the pest is distinctive looking in its other life stages (see the Pest Alert at bit.ly/3t9vxj6). If you find a spotted lanternfly, collect samples for evidence, snap a picture, and report it to the CDFA.

Research on Demand: PD Research Symposium Recordings Now Online

Recordings of select presentations from the 2021 Pierce's Disease Research Symposium are now available on the Pierce's Disease/Glassy-Winged Sharpshooter Board YouTube channel at bit.ly/3JxHyKd, including:

- The Use of Transgenic Rootstocks to Suppress Pierce's Disease
- Pierce's Disease-resistant Varieties Current and Future
- Virulence Differences in *Xylella fastidiosa* Isolates Collected from Grape in California
- Local Adaptation of *Xylella fastidiosa* Strains in California: Genomics and Insights from the Field
- Optimizing *Paraburkholderia* for Pierce's Disease Control
- Zinc Nanoparticles Against *Xylella fastidiosa*
- Gene Editing in Grapevines Using Protoplasts
- Structure-function of Red Blotch Virus

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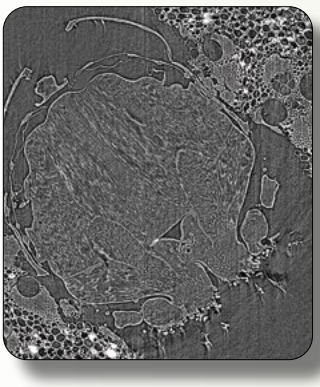

Reconstructed 3D image showing a cross-section through a blue-green sharpshooter.

Modeling of *Xylella fastidiosa* Transmission and Grapevine Susceptibility Using Fluid Dynamic Simulations

Project Leaders: Rodrigo P.P. Almeida and Elizabeth G. Clark, U.C. Berkeley; Andrew J. McElrone, USDA Agricultural Research Service; and Leonardo De La Fuente, Auburn University

Little is known about how insects transfer *Xylella fastidiosa (Xf)* to plants while feeding on xylem sap. The team is integrating 3D digital models with tools to simulate fluid and particle transmission to infer how bacterium transmission occurs. Early results suggest that this approach will be an effective technique to illuminate critical structural aspects of xylem sap-feeding insects and plants susceptible to Pierce's disease. This may reveal how and why some insects are more effective at transmitting *Xf* than others. Read more at bit.ly/3gz7p7m.

Developing a GMO-free RNA Interference Approach to Mitigate Red Blotch Negative Impacts on Grape Berry Ripening

Project Leader: Laurent Deluc, Oregon State University

RNA interference is a plant's biological response to the presence of pathogens that repress a virus's activity and replication within the plant. Once infected, the plants will recognize and produce specific nucleic regions, or "hot spots," of the viral genome to activate the RNA silencing machinery. The main goal of this project is to identify these "hot spots" of the grapevine red blotch virus. This could help develop innovative technology tools such as ectopic RNA molecule application in vineyards to mimic the virus's presence and make the plants immune or able to quickly fight off a virus. Read more at bit.ly/3Jnejc8.

The root growth of an 8-week-old microvine plant in tissue culture.

Close-up of vine mealybugs.

Genomics Resources for Identification, Tracking, Surveillance, and Pest Management of Vine Mealybug in Vineyards

Project leaders: Lindsey Burbank, Rachel Naegele, and Mark Sisterson, United States Department of Agriculture; and Dario Cantu, University of California, Davis

Continued use of chemical control for insect pests such as mealybugs could lead to development of insecticide resistance. It is necessary to explore alternative control strategies based on a detailed understanding of pest biology. This project is expanding DNA sequence information for vine mealybug representative of pest populations across California. This information will be used to track pest populations, evaluate prevalence of insecticide resistance, and develop new pest control technologies based on novel genetic targets. Read more at bit.ly/33euhpq.

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.

Doing More with Less: Slowing the Spread of Vine Mealybug

Area-wide mating disruption efforts offer a strong defense against vine mealybug (VMB). But to achieve the collaboration key to this control method, growers must overcome cultural barriers and invest in long-term solutions.

Compared to most other pests, the VMB has a higher potential for mating, grows faster, consumes more, and inflicts more damage on vineyards. Sophisticated, strategic control methods are required to curb the pest's damage. Area-wide collaboration lies at the heart of these efforts.

Growers battling VMB often turn to insecticides for quick relief but rarely achieve lasting results. Mating disruption is a more sustainable, organically acceptable control option, but does take time. A research team led by Dr. Kent Daane at the University of California, Berkeley, found that VMB infested vineyards with consistently applied sex pheromones will see the pest population start to steadily decrease after three years. This method is successful in keeping VMB numbers low, but offers little to vineyards with advanced infestations.

The success of mating disruption hinges on its scale. An individual grower can effectively use this control method but still fail to curb the damage inflicted by VMB. Because it can travel up to a half-mile by wind, the pest is equally one grower's problem and their neighbors'. Mating disruption is most effective when used over a large area.

But cultural barriers can hinder the wide-scale adoption of this approach. Infestation stigma and fear of winery blacklists keep many growers silent about their battles against VMB. Cut off from valuable collaboration and important resources, growers are often susceptible to the pest management misinformation that abounds. Furthermore, area-wide alliances require that growers overcome a sense of individualism and fierce self-reliance that many pride themselves on.

One successful example of this collaborative approach is the Jahant Appellation Vineyard Alliance (JAVA) in Lodi, a group of 21 growers who are working together to eradicate VMB from their 3,000 acres. "We're trying to do this regional approach for the benefit of the neighborhood," said Aaron Lange with Lange Twins Winery and Vineyards and Pierce's Disease/Glassy-Winged Sharpshooter Board member. "Hopefully, other people can replicate this in their neighborhood to try to encourage more neighborhood cooperation to attack these pest and virus issues."

It is important to remember that costs can be lowered and results can be maximized by large-scale collaboration. Coordinating area-wide applications later in the season and sharing application supplies can offer significant savings. Concentrating pheromone applications in upwind portions of vineyards can also stretch costly supplies.