

Grapevine Red Blotch Disease

Rhonda Smith

In 2011, a new grapevine virus was discovered in vines showing symptoms that occasionally had been confused with grapevine leafroll disease. Grapevine red blotch associated virus (GRBaV) has been confirmed in both red and white varieties within California and in other states. Disease symptoms in red varieties include reddening of regions within leaf blades, along with red veins and petioles and delayed fruit maturity. Disease symptoms in white varieties include subtle-to-obvious chlorotic regions within leaf blades.

The virus name applies to all varieties including whites. Currently, it is not known what factors affect symptom onset and development in diseased vines; variety, rootstock and vine age may play a role. In red varieties, the first signs of red coloration in basal leaf blades in 2013 occurred in June and July. Based on experience from past years, by the end of this season, foliar disease symptoms will occur in most or all leaves in the canopy. However, in white varieties, timing of symptom onset and severity of symptom expression has not been tracked as well.

Some north coast growers have had experience with grapevine red blotch disease long before the disease was named or a virus was associated with the symptoms. Beginning in 2007, an increase in incidence of vines with red leaf symptoms was observed by grape growers in some Napa Valley vineyards. Grapevine leaf petiole and cane samples were

collected from symptomatic vines by growers and UC researchers and tested by commercial laboratories and UC Davis Foundation Plant Services, respectively. Test results were most often negative for grapevine leafroll-associated viruses (GLRaVs).

How the virus was identified

In fall 2011, a new circular DNA virus – later named GRBaV – was identified by virologists at UC Davis Foundation Plant Services and USDA-ARS at Davis in 3 diseased vines of Cabernet Sauvignon, Cabernet franc and Zinfandel. This new virus is identical to a DNA virus isolated by Cornell University virologists from a Cabernet franc vine.

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CURRENT ISSUES IN VINEYARD HEALTH

November 22, 2013
UC Davis, DaVinci Building

- 9:00 INTRODUCTIONS
- 9:15 VITICULTURE AND THE NATIONAL PLANT DIAGNOSTIC NETWORK
Richard Hoenisch, Analyst, National Plant Diagnostic Network,
Department of Plant Pathology, UC Davis
- 10:00 BREAK
- 10:15 BROWN MARMORATED STINK BUGS: ID, EFFECTS ON GRAPES AND WINE
Chuck Ingels, UCCE Farm Advisor and Interim County Director, Sacramento County
- 11:00 RESEARCH UPDATE: GRAPE MEALYBUG AND LEAFROLL DISEASE
Dr. Monica Cooper, UC Viticulture Advisor, Napa County
- 12:00 LUNCH
- 1:00 RESEARCH UPDATE: RED BLOTCH DISEASE IN NAPA
Dr. M.R. 'Sudi' Sudarshana, Research Biologist, USDA- ARS,
Department of Plant Pathology, UC Davis
- 1:50 EFFECTS OF GRAPEVINE RED BLOTCH VIRUS ON VINE PERFORMANCE
Rhonda Smith, UCCE Viticulture Advisor, Sonoma County
- 2:40 BREAK
- 3:00 THE NATIONAL CLEAN PLANT NETWORK – HEALTHY GRAPE PLANT MATERIAL FOR
OUR FUTURE”
Dr. Deborah Golino, Cooperative Extension Specialist,
Department of Plant Pathology, UC Davis.
- 4:00 CLOSE

November 22: Wednesday, 8:30 am – 4:30 pm
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Weeds Good Indicator of Soil Type

We tend to see weeds as unwelcome intruders that threaten our efforts to create the perfect farming environment. But weeds can tell us a lot about the soil being farmed and can be a food source for beneficial insects and habitat for wildlife.

Illinois at Urbana-Champaign Horticulture educator, Kelly Allsup, says weeds can tell you a lot about your soil and farming practices. There is no need to pull out the herbicides; rather, botany can help you prevent large aggressive populations of nuisance weeds by identifying soil issues. Geochemical botanists read the kind of plants growing in an area and are able to determine what minerals are in the soil. If you have the following weeds, your soil may be letting you know about a soil issue:

- Chicory and bindweed are indicators the soil is too compacted. Aeration and a soil conditioner like compost or cover crop can help reduce the populations of these offenders.
- Foxtails, dock and horsetail thrive in moist or wet conditions.
- Dandelion and stinging nettle is an indication of acidic soil. Most plants prefer a slightly acidic soil so a soil test may be necessary to determine if the soil is too acidic for plant growth.
- Thistle is an indication your soil needs more acid. This can be achieved with soil amendments like ferrous sulfate or aluminum sulfate. A soil test will indicate how much will be needed to apply.
- Pigweed indicates an abundance of nitrogen.
- Red clover indicates an excess of potassium.
- Purslane and mustard are an indication of an abundance of phosphorous.
- Crab grass is an indication of poor fertility.

In conclusion, a few pre-emptive actions to improve soil conditions could make weeds disappear, reducing herbicide use. Any horticulturist will advocate for soil testing to find out exactly what needs to be added to improve soil fertility, crops quality and yield.

Source: University of Illinois at Urbana-Champaign

BSMB takes hold in Sacramento neighborhood

Jeannette Warnert

A well-established and reproducing population of [brown marmorated stink bugs](#) (BSMB) has been found in a Midtown Sacramento neighborhood, reported Chuck Ingels, UC Cooperative Extension advisor for Sacramento County. The infestation seems to be centered around 13th St., south of Capital Park. This is the first reproducing population in California outside Los Angeles County.

Ingels said he had no difficulty finding the pests on tree foliage and flying around when he visited the site last week. The California Department of Agriculture has designated BMSB a Class B pest. "This is one of the worst invasive pest we've ever had in California" Ingels said. Brown marmorated stink bug affects many different crops and is a serious residential problem. It moves around easily, so can be expected to spread. It can fly up to a half mile at a time and also travels long distances by hitching rides in vehicles or inside furniture or other articles when they are moved, often during winter months. As a result, most new infestations are found in urban areas.

Brown marmorated stink bugs are native to China, Japan and Korea. They were first documented in the in the United States in Pennsylvania in 2001, but was likely established there several years earlier. The pest has spread throughout Pennsylvania, is believed to be established in at least 15 states, and has been found occasionally in more than a dozen additional states. In 2004, BMSB made its way to Oregon and is now established in northwest Oregon and a portion of Southern Washington. The National Agricultural Pest Information System maintains a map showing current infestations, but it does not yet show California finds. The pest has been present in Los Angeles County for 6 years.

BMSB feeds on dozens of California crops, including apples, pears, cherries, peaches, melons, corn, tomatoes, berries and grapes. Feeding on fruit creates pock marks and distortions that make the fruit unmarketable. In grapes, berries collapse and rot increases. Wine tasters have been able to detect stink bug odor in wines made from grapes that had 10 bugs in a 35-pound lug. It is also a pest of many ornamentals, especially fruit-bearing trees, princess tree (*Paulownia tomentosa*), common Catalpa (*Catalpa bignonioides*) and tree-of-heaven (*Ailanthus altissima*).

In addition to the damage caused by the BMSB feeding, the "true bug" can cause disturbing problems for homeowners in the winter. When the weather cools down, bugs migrate in droves to sheltered areas, including inside homes and buildings.

"These bugs aggregate in such numbers that there are reports of people using manure shovels and five-gallon buckets to dispose of them," Ingels said. "The strong, unpleasant odor the insects emit when disturbed makes cleanup still more daunting.

BSMB

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BSMB is a pest in its homeland, but is mostly controlled by parasitic wasps. USDA researchers have collected parasitic wasps in Asia, but they must be tested extensively before they can be released in California, a process that will take until 2016.

"Parasitism is our best hope for reducing populations," Ingels said. "Chemical control of BMSB is very challenging."

Ingels said the best way to keep them out of homes is to exclude them by sealing off any potential entry points, especially around window air conditioning units. Insecticides that have been shown to be effective in the lab are often less effective in the field. In and around the home, insecticides that have efficacy are mostly pyrethroids and neonicotinoids, both of which can have harmful off-site effects.

Pesticides showing efficacy on farms also include organophosphates and carbamates. But growers have worked hard to develop effective Integrated Pest Management programs, and the use of these broad spectrum sprays will set these programs back. There are also pest resistance concerns with increasing use of these products. Control for organic growers and home gardeners will be most troublesome, and involves the use of row covers, trap crops, pheromone traps, and predator insects. Ingels is asking growers to be on the lookout for BMSB.

"Because they are strong fliers, it's just a matter of time before they reach farms," Ingels said. The pest can be distinguished from ordinary brown stink bugs by its larger size, marbled-like coloring on its shield and white markings on the extended edge of the abdomen. BSMB also has distinctive white bands on the antennae and legs. The UC Integrated Pest Management Program has posted a video on [YouTube](#) to aid in identifying the pest.

Traps with sex pheromones or other attractants can be used to monitor for the pest, but they are often poor at trapping the bugs even when populations are high. The best monitoring method is to inspect foliage throughout the year, and larger branches in late summer and fall for aggregating bugs. A quick method is to beat foliage over a piece of cardboard or sheet. If suspected BSMB are found, place some in a container and note where and when they were collected. Take the sealed container to the county agricultural commissioner or local UC Cooperative Extension office.

Jeanette Warnert is a Public Information Representative with University of California Ag and Natural Resources.

Blotch Disease

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To identify the new virus, the researchers at Davis utilized next generation (“deep”) sequencing technology. The process sequences all the genetic material (nucleic acid) in a plant sample and sorts it into known categories so that researchers can decide if what is left over is a new, previously unreported virus.

Determining the virus’ role

Next generation sequencing may identify a new virus in a diseased grapevine; however it does not mean the virus caused the disease. Grapevine Syrah virus (GSyV-1) is an example of a virus that was identified in a Syrah vine with Syrah decline; however thus far the virus has not been shown to cause syrah decline disease or any other disease in grapevines.)



Figure 1. Cabernet Sauvignon displaying Red Blotch from 2013. More photos of symptomatic leaves can be found on the web [here](#).

Virologists at Cornell University are tasked with determining if GRBaV causes grapevine red blotch disease. It is one objective of a grant given to Cornell and USDA-ARS scientists this year by the American Vineyard Foundation.

Investigations to learn how the virus is spread

Cornell researchers also identified the virus as a very unique member of the Geminiviridae family. Some geminiviruses are spread by leafhoppers and whiteflies. At this time, it is not known if leafhoppers or other insects can vector GRBaV in the field. A research group in Washington State University has determined the virus can be moved by insects to potted vines.

Over the last 3 years, an increasing number of symptomatic vines have been mapped in specific blocks at the UC Oakville Experimental Vineyard (Oakville Station); whereas in other blocks at that location, directional spread is not evident (J. Wolpert, Retired - CE Viticulture Specialist and M. Anderson, UCD Staff Research Associate; pers. comm.). Epidemiological studies to determine the complex relationships between the grapevine, an insect and the virus are assigned to USDA-ARS researchers.

The virus is known to be spread by propagation. Foundation Plant Services virologists successfully graft inoculated healthy potted vines with the virus by using chip buds taken from vines known to be infected with GRBaV. What is not known is the pattern of *Continued on Page 7*

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distribution of the virus inside the plant after it is grafted and how long it takes symptoms to develop following inoculation.

Identifying red blotch diseased vines

The diagnostic test (a PCR assay) to detect GRBaV developed by the USDA-ARS group at Davis became available in October 2012, and since that time commercial laboratories have processed thousands of samples submitted by growers. The virus has been confirmed in several varieties in California and in several California counties and other states. At this time, all scion varieties and rootstock plants regardless of parentage are thought to be susceptible.

In 2011 and 2012, samples were collected from individual symptomatic vines of red varieties in Napa, Sonoma and San Luis Obispo counties. GRBaV was detected in ~95% of symptomatic grapevines and in ~2.7% of asymptomatic grapevines. This is a very high correlation between disease symptoms and the virus – higher than the correlation between grapevine leafroll disease symptoms and leafroll associated viruses. Although symptoms are highly correlated with GRBaV, it does not mean the virus causes the symptoms. However, it does mean that symptomatic vines are likely to be infected with GRBaV.

To verify the presence of the virus, samples must be collected and submitted to a commercial diagnostic lab for testing by PCR assay. Fall and winter are ideal for detecting many grapevine viruses and the basal portion of current year canes are submitted for testing. If you plan to submit samples from vines to confirm the presence or absence of GRBaV, contact the lab of your choice or visit their website for sample collection protocol. For a list of commercial labs in north and central California, [click here](#).

In 2013, UC Cooperative Extension, with grant funding from the American Vineyard Foundation, has documented symptom development in vines confirmed to be infected with GRBaV by PCR assay and NOT infected with leafroll viruses. Three sites – two in Napa County and one in Sonoma – are monitored regularly. At this time of year, the foliar symptoms of grapevine red blotch disease in red varieties are more easily distinguished from symptoms caused by grapevine leafroll disease. Red blotch symptoms in white varieties are also present; they may be confused with potassium and perhaps other nutritional deficiencies.

Rhonda Smith is the University of California Cooperative Extension viticulture farm advisor in Sonoma County.

Dr. Ramming Named to the USDA– ARS Science Hall of Fame

Dr. David Ramming earned a place in the Agricultural Research Service (ARS) [Science Hall of Fame](#) for discoveries that improved the quality of raisin and table grapes. ARS is the chief intramural scientific research agency of the U.S. Department of Agriculture (USDA).

David Ramming, who retired in January from the ARS San Joaquin Valley Agricultural Sciences Center at Parlier, CA, developed several varieties of table grapes and raisin grapes currently being produced and has been instrumental in developing technologies that address a number of grower concerns. His 15 varieties of table grapes represent more than half of the table grape production in California.

He also led research that resulted in a plant regeneration system that allows for the routine insertion of genes into grapes, speeding up the process for developing improved varieties. Embryo rescue techniques developed by Ramming also have significantly shortened the time required for development of new table grape and raisin grape cultivars.

ARS scientists conduct research to help provide solutions to agricultural issues that affect the lives of Americans each day. They work to ensure high-quality, safe food and other agricultural products; improve nutrition and health of children; enhance development of new bioenergy sources; and support agricultural sustainability and rural wealth creation.



CALENDAR OF EVENTS

Local Meetings and Events

San Joaquin Valley Grape Symposium

January 8, 2014

7:00 a.m. — 12:00p.m.

C.P.D.E.S. Hall

172 West Jefferson Avenue

Easton, CA

SEE INSERT

U.C. Davis University Extension Meetings (800) 752-0881

Current Issues in Vineyard Health

November 22, 2013

9:00 a.m. — 4:00 p.m.

UC Davis, DaVinci Building

Section: 133VID251

See page 2

Current Wine and Winegrape Research

February 12, 2014

9:00 a.m.— 6:00 p.m.

Davis Conference Center, Ballroom A,B, and C

Old David Rd. Davis, CA

Section: 133VIT203



CANCELED —CANCELED

The 7th International Table Grape Symposium have been canceled. The Australian organizing committee is planning on holding the meeting the month of November 2014.

More information will be available in the next two months.

Persons wanting more information regarding the 7th International Table Grape Symposium should contact: David Oag
+61 427427517
david.oag@deedi.qld.gov.au

CANCELED —CANCELED

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San Joaquin Valley Grape Symposium

Wednesday January 8, 2014

C.P.D.E.S. Hall

172 W. Jefferson Avenue - Easton, California



- 7:00 am** **Registration**
- 7:45 am** **Morning Welcome**
- 8:00 – 8:30 am** **Research Update: Rootstocks for Raisin Production**
Sonet VanZyl, California State University, Fresno
- 8:30 – 9:15 am** **Research Update: Raisin Production Canopy Management**
Matthew Fidelibus, UC Davis & UC Kearney Ag Center, Parlier CA
- 9:15 – 9:45 am** **Raisin Moth Biology, Damage and Management**
Kent Daane, UC Berkeley & UC Kearney Ag Center, Parlier CA
- 9:45 – 10:15 am** **BREAK**
- 10:15– 10:45 am** **Research Update: Raisin Grape Breeding Program**
Craig Ledbetter, USDA-ARS, Parlier CA
- 10:45 – 11:15 am** **Economics of Producing Raisins**
Annette Levi, California State University, Fresno
- 11:15–12:00 pm** **Research Update: Grapevine Trunk Diseases and Grower Survey**
- 12:00 pm** **LUNCH**

Continuing education PCA and CCA hours have been requested.



Registration Form or Register online with a credit card at <http://ucanr.edu/sjvgrapesymposium>

(*LATE REGISTRATION at the door — \$20.00)

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Please enclose a check payable to: **UC REGENTS**

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Fresno, CA 93710

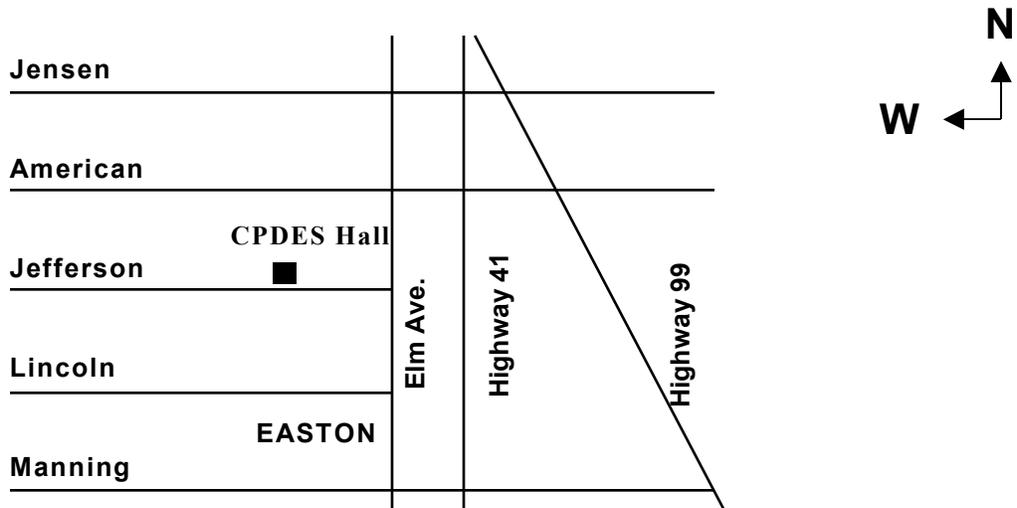
Meeting/Proceedings and Lunch: _____ x \$15 each = \$ _____

Check Number: _____ Amount Enclosed: \$ _____

San Joaquin Valley Grape Symposium Program

Wednesday, January 8, 2014

C.P.D.E.S. Hall
172 W. Jefferson Avenue
Easton, California



From North of Fresno: Take Highway 99 south to Highway 41 south. Take Highway 41 south to American Avenue. Turn west on American Avenue towards Elm Avenue. Turn south on Elm Avenue towards Jefferson Avenue. Turn west on Jefferson. C.P.D.E.S. Hall will be on your right.

From South of Fresno: Take Highway 99 south to Manning Avenue. Turn west on Manning Avenue to Elm Avenue. Turn north on Elm Avenue towards Jefferson Avenue. Turn west on Jefferson Avenue. C.P.D.E.S. Hall will be on your right.

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