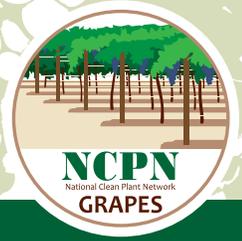


# FACT SHEET

National Clean Plant Network



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## Grapevine Red Blotch Disease

### What is red blotch?

*Grapevine red blotch virus* (GRBV) is another addition to the list of more than 80 graft-transmissible agents that have been identified in grapevines. This virus has been shown to be the causal agent of red blotch disease that was described for the first time on Cabernet Sauvignon in Napa Valley in 2008.

### What are the symptoms of red blotch?

Much like leafroll disease, leaves in red cultivars turn red in early fall primarily at the base of the shoots. Unlike leafroll, red blotch disease in red cultivars can sometimes show pink/red veins on the leaf undersides and no rolling. In white cultivars leaf blades have marginal and interveinal chlorosis - regions of which may become necrotic. Symptom severity can be variable from year to year.

Red blotch disease symptoms are not diagnostic. Vines should be tested to confirm GRBV infection

### How serious is it?

Red blotch disease consistently reduces sugar accumulation, increases malic acid and less consistently increases pH and titratable acidity. Cluster weight may be reduced and the effect on yield varies by cultivar and growing conditions. Pruning weight has also been shown to be reduced by 5% in infected Cabernet franc vines.

### Where has it been found?

Red blotch disease is widely distributed in the United States and has been identified in Canada. It occurs in red and white vinifera cultivars as well as interspecific hybrids, rootstocks and non-cultivated *Vitis* spp. living near vineyards.

### When was it found?

Investigations into what appeared to be a new disease began in 2008 in a symptom mapping block at the UC Oakville Research Station. *Grapevine red blotch virus* was reported in independent studies in California and New York in 2012.

Red blotch was also confirmed in archival leaf tissue from the 1940s, indicating that the virus has been present in California since at least that time.



Severe red blotch symptoms in Chardonnay.



Moderate red blotch symptoms in Chardonnay.



Red blotch symptoms in Merlot.



Red blotch symptoms in Malbec

Photos: Rhonda Smith, UCCE, Sonoma Co., California

## How does it spread?

Based on the wide host and geographic distribution of GRBV and the fact that the virus is transmitted by grafting, it is likely that spread has primarily occurred through propagation material. Also, an increased incidence of GRBV over time in vineyards suggested the existence of a vector. At least one insect vector, the three-cornered alfalfa hopper *Spissistilus festinus* (Hemiptera: Membracidae), has recently been confirmed to transmit GRBV to potted vines in lab studies.

## How is it treated?

Like other viruses, once it is present in a vineyard there is no cure. However, there is evidence that GRBV can be eliminated using microshoot tip culture, the same method used to eliminate other viruses, to establish clean foundation vines.

## What kind of virus is it?

Analysis of the genomic nucleotide sequence found a new circular, monopartite DNA virus that is assigned to the genus *Grablovirus* and family *Geminiviridae*.

## How is it detected? How can I get my vines tested?

GRBV can be detected by PCR test. Several labs offer a test for GRBV.

## What is the status of vines at Foundation Plant Services at Davis?

All of the vines planted at the new Russell Ranch Foundation vineyard have been tested for red blotch and none of them are infected. All of the vines in the Classic Foundation Vineyard have been tested and the few vines that were found to be infected were removed. Test records are available by request to Foundation Plant Services.

## What is being done?

Current investigations focus on the field transmission of GRBV to healthy vines by insect vectors and the spread of the disease in vineyards as well as improving detection techniques.

## References:

Al Rwahnih, M., Dave, A., Anderson, M., Uyemoto, J. K., and Sudarshana, M. R. 2012. Association of a circular DNA virus in grapevines affected by red blotch disease in California. Proc. 17th Congress of the International Council for the Study of Virus and Virus-like Diseases of the Grapevine (ICVG), Davis, California, USA, October 7-14 2012, pp. 104-105.

Bahder, B.W., Zalom, F. G., Jayanth, M. and Sudarshana, M.R. 2016. Phylogeny of geminivirus coat protein sequences and digital PCR aid in identifying *Spissistilus festinus* as a vector of Grapevine red blotch-associated virus. *Phytopathology* 106:1223-1230.

Krenz, B., Thompson, J., Fuchs, M. and Perry, P. 2012. Complete genome sequence of a new circular DNA virus from grapevine. *Journal of Virology* 86:7715.



Red blotch in Cabernet franc.



Leafroll in Cabernet franc.

Photos Marc Fuchs, Cornell University, Geneva, NY



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