

Preliminary Survey for GLRaV in Niagara Vineyards Oct. 2013 (McFadden-Smith, Hoshkiw, Stobbs, Greig)

b. Symptom expression associated with GLRaV-infected vines (Stobbs, Greig)

GLRaV in red (left) and white (right) grape variety



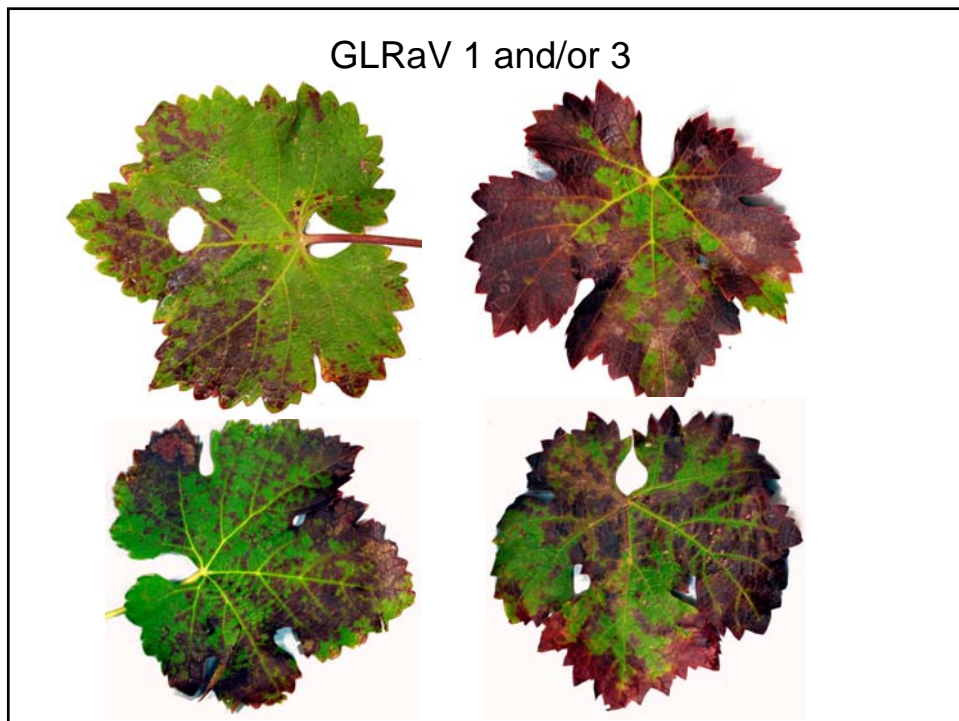
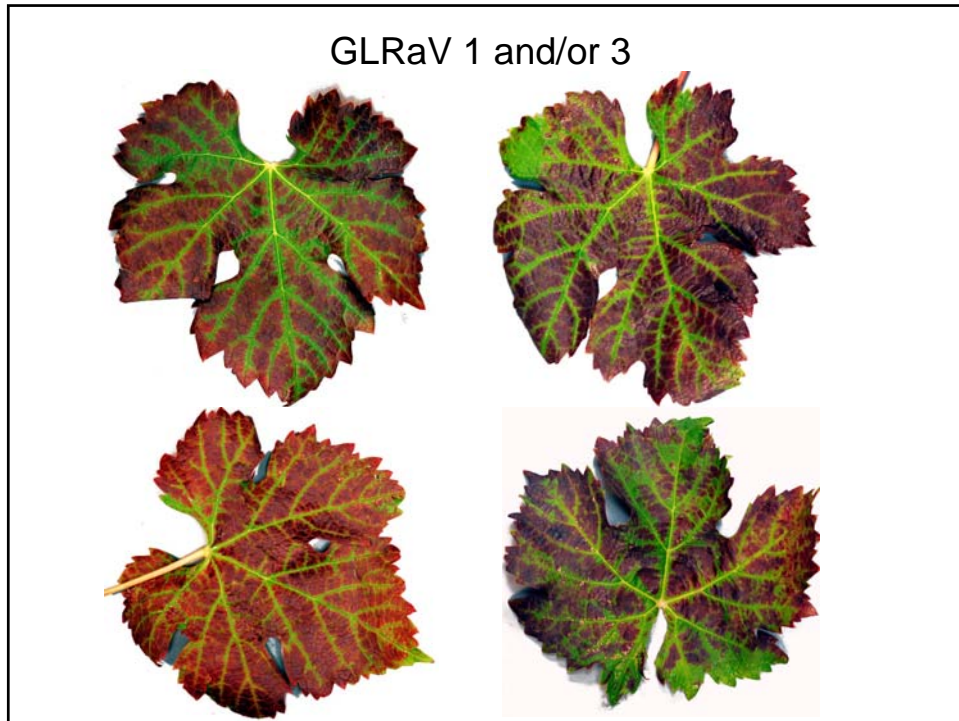
GLRaV in Chardonnay

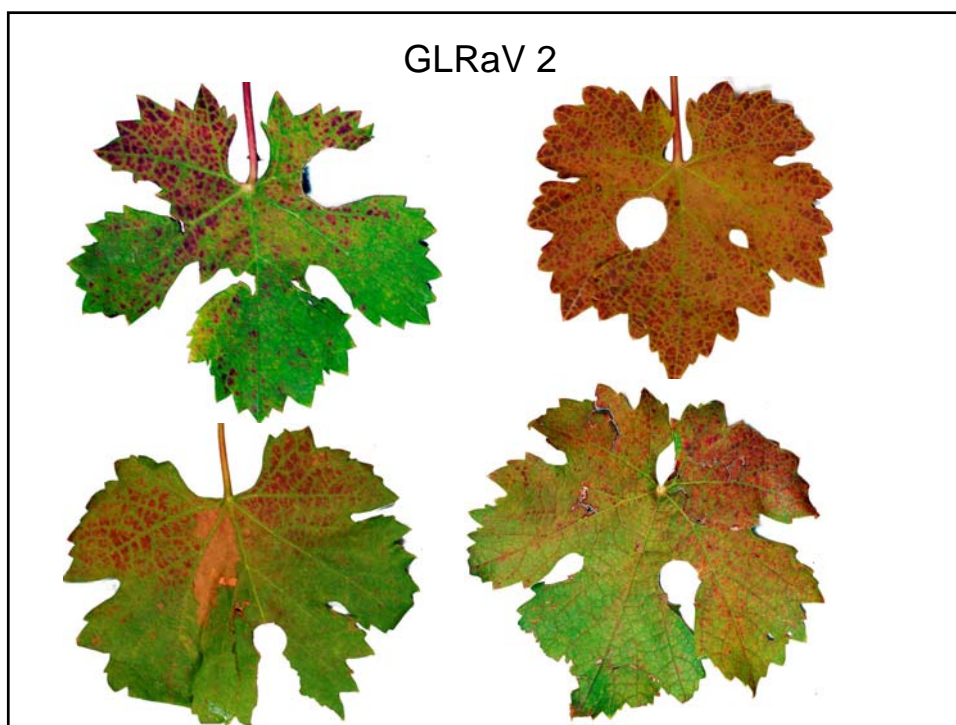
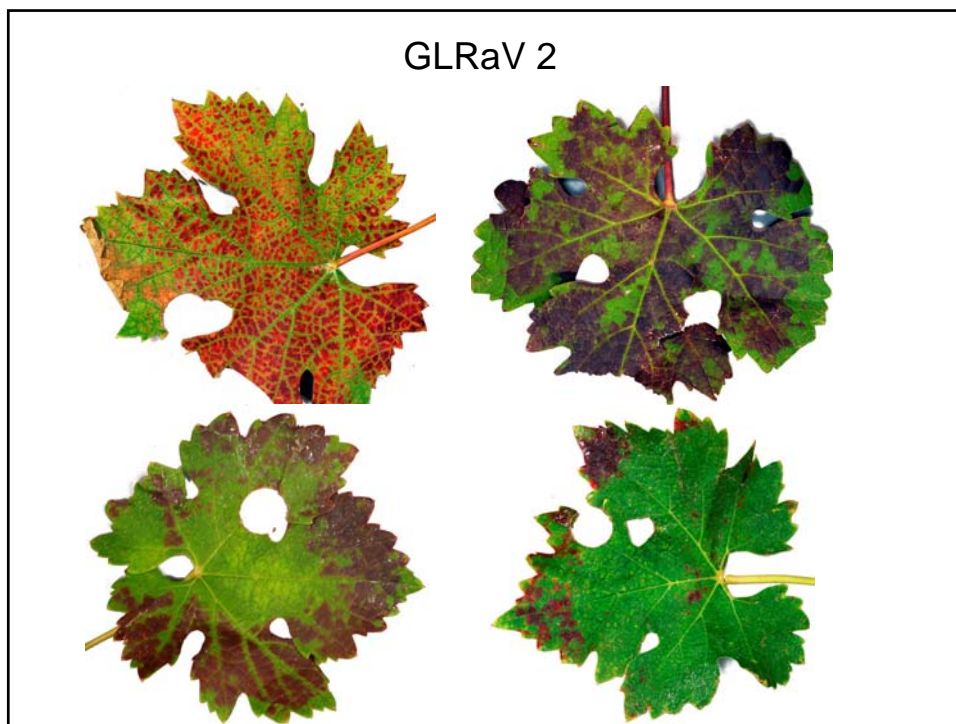


Symptom expression (GLRaV)

Methodology:

- Survey leaves were compositely tested by dasELISA using the Bioreba test kits for GLRaV 1 & 3, and GLRaV 2.
- Leaves from some of the positive composite samples were tested individually and those leaves testing positive for GLRaV were photographed.
- Presence of red blotch (RB) in many of the photographed leaves is unknown since not all the survey samples were assayed for RB due to budget constraints.





GLRaV 1 and/or 3 plus 2



Suspicious – not GLRaV 1,2 or 3



Other observations

- In red varieties, berry colour development was not as advanced in GLRaV infected vines.
- No noticeable reduction in bunch sizes.
- Visual symptom mapping of vineyards showed that dead vines or recently replanted vines often bordered vines showing GLRaV symptoms. GLRaV may predispose to winter kill?

Prevalence of GLRaV in Niagara Vineyards

Preliminary Limited Survey 2013

Leafroll viruses	Number of sites (n=40)
1 and/or 3	19
2 only	1
1 and/or 3 plus 2	11
No infection	9

GLRaV 2 infections can occur singly or in mixed infections with GLRV 1 and 3 in vines, but only 1 site was identified with only GLRaV 2 infections.

Adaptation of a Direct Real Time PCR for the rapid detection of GLRaV

- Targets the RNA rather than protein of the virus.
- Eliminates the requirement for RNA extraction by using a specially developed buffer system (DiPEB).
- 10 – 100 fold more sensitive than ELISA, can be completed within 2 hrs versus 2 days.
- Has been shown to reliably identify GSPaV in grape tissues and a range of other viruses in other hosts.
- Small sequence amplicons (100 bp) are being developed and tested for recognition of GLRaV strains.

Summary

- Visual detection of GLRaV in red varieties is not always reliable. New infections may be difficult to detect.
- Distribution of symptomatic leaves on vines is highly variable, as infection may not occur in all canes.
- Symptoms in white varieties are not as obvious and leaf chlorosis/leaf rolling may not be apparent.
- Downward leaf rolling appears to be a fairly consistent symptom associated with leafroll infection, but can be caused by other viruses or abiotic factors.