

Epidemiology of GRBaV in California vineyards

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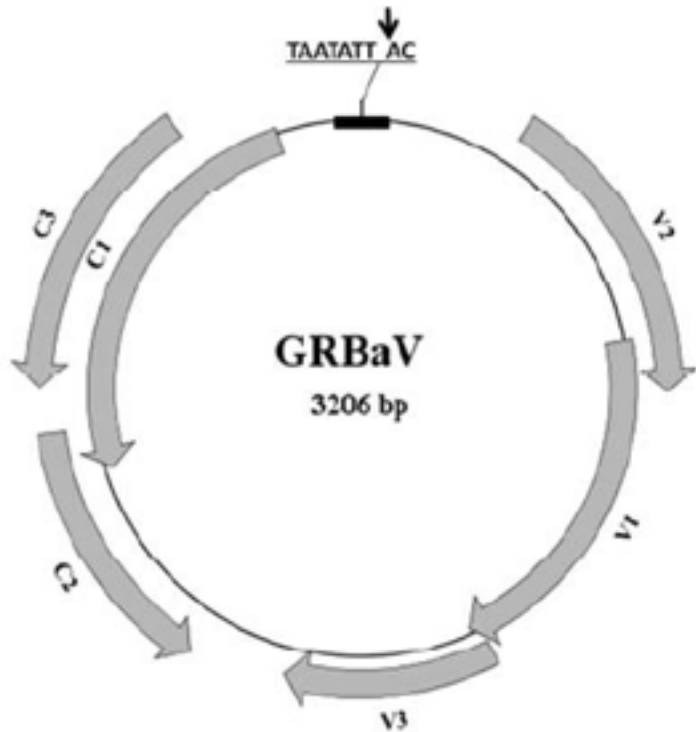
Grapevine red-blotch disease

- Began noticing in 2008 symptoms similar to leafroll but also distinct from leafroll



- Genome sequenced in 2012 and 2013 by groups at Cornell and UC Davis, verified new virus

Grapevine red-blotch associated virus (GRBaV)



- Small genome (3,206 base pairs)
- Single stranded and circular

Important Questions

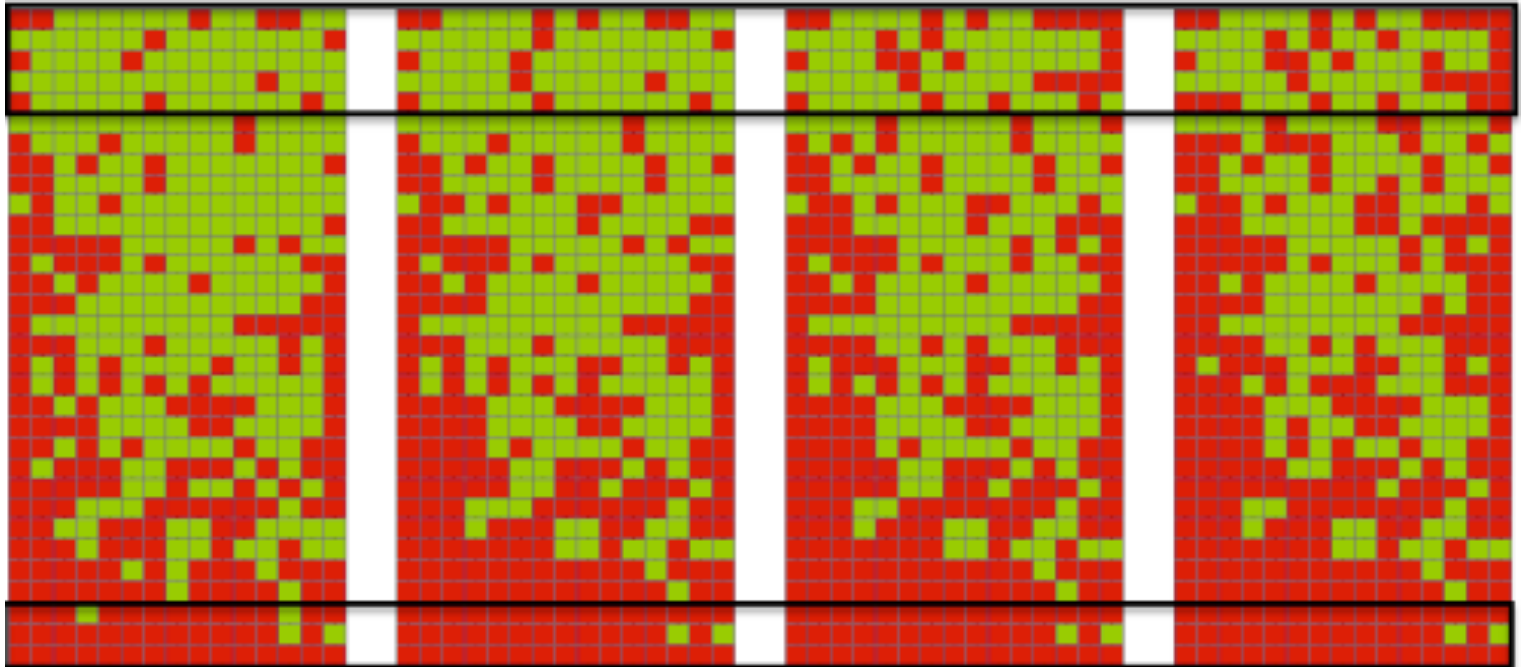
- How does it impact the grapes?
- How does it impact the wine?
- Is it spreading?
- What is the vector? Poojari et al. 2013
 - Virginia Creeper Leafhopper (*Erythroneura ziczac*)???



Spread of GRBaV

- Block of Cabernet Sauvignon at UCD Oakville Station was established in 2001
- Symptom data taken in 2011
- First five vines and last three vines of each row tested with qPCR in 2012, all vines observed for symptoms
- In 2013, all vines observed for symptoms, continued testing
- In 2014, all vines observed for symptoms, finished testing

46.5% infected in 2011



2011

2012

2013

2014

4.4%

3.8%

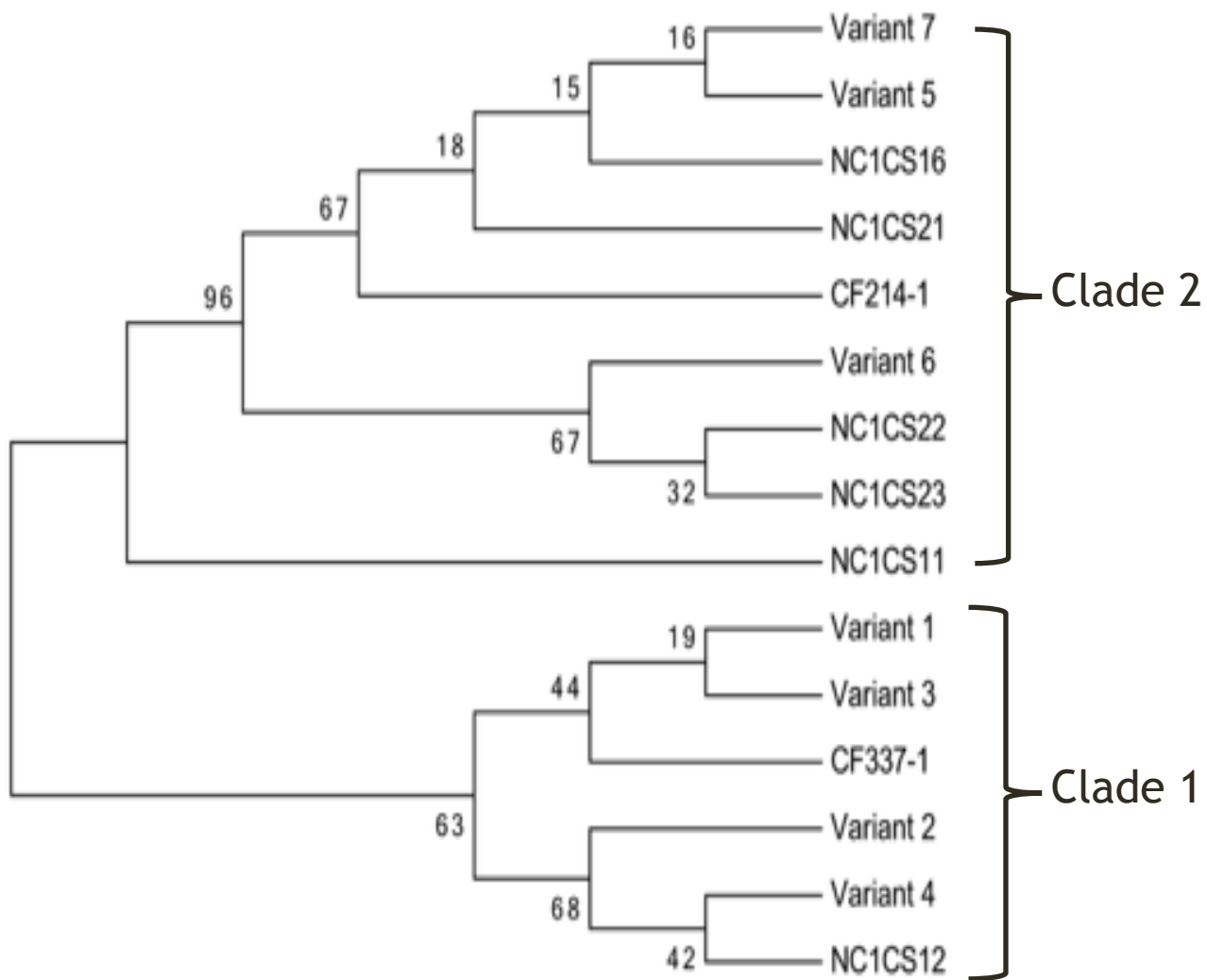
5.2%

13.4% increase from 2011

59.9% infection currently

Sequence Comparison

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CS337-1      GAAAGTTCTCTGAATGATATTGATATTTGTGGTGATGTTGATGCGTTAGGGGATGAGGCT
Variant_1    .....
Variant_4    ....A.....C.....A..
Variant_3    .....
Variant_2    .....
NC1CS11     .....
NC1CS12     .....Y.....W...S...
Variant_7    .....T.....A...G...
Variant_5    .....T.....A...G...
Variant_6    .....T.....A...G...
NC1CS16     .....T.....A...G...
NC1CS21     .....T.....A...G...
NC1CS22     .....T.....A...G...
NC1CS23     .....T.....A...G...
CS214-1     .....T.....A...G...
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Alternate Hosts for Virus

- 113 samples of Himalayan blackberries taken from various infected vineyard blocks
- 62 samples tested positive with qPCR
 - Verified with sequence data
- Low viral titers

Summary

- GRBaV can spread under natural conditions in California
- Two distinct genotypes
- Present in Himalayan blackberries



Current Work

- Identifying vector(s)
- Other species as hosts of GRBaV
- Role that blackberries play in epidemiology

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Thank you!