

## Grapevine leafroll disease

“Leafroll”

Pathogen

### Grapevine leafroll-associated viruses (GLRaV)

Complex of RNA viruses  
High genetic variability & adaptability  
GLRaV-3 is most common worldwide  
Broadly distributed worldwide  
Phloem-limited

## Grapevine red blotch disease

“Red blotch”

### Grapevine red blotch virus (GRBV)

DNA virus  
Diverged from *wild Vitis latent virus* ~9000 y.a.  
Likely N. American in origin  
2° spread common in California and southern Oregon  
Phloem-limited

### Mealybugs & Soft scale

Pseudococcidae



Grape mealybug  
Vine mealybug  
Obscure mealybug  
Longtailed mealybug  
Gill's mealybug  
European fruit lecanium scale



### Vector(s)

### Threecornered alfalfa hopper (TCAH)

Membracidae



### Vector behavior

Phloem feeding insects  
Grapevine is feeding & reproductive host  
Limited alternate host range  
Principally short distance dispersal  
Only male has wings

Phloem feeding insect  
Legumes (clover & vetch) are principal reproductive hosts  
Wide (feeding) host range  
Longer distance dispersal (>4000 ft)  
Specialized muscles in hind femora for jumping

### Leafroll disease management

Start clean: virus-tested plant material  
Quantify symptomatic vines: vine-by-vine mapping  
Remove infected vines individually (rogue) or in groups (spatial roguing)  
Monitor grape & vine mealybug with pheromone-baited traps  
Practice IPM for vine mealybug  
Coordinate management with neighbors and in regional groups



### Red blotch disease management

Start clean: Virus-tested plant material  
Identify patterns of infected vines (aggregated areas & random infections)  
Aggressively remove sections of vines in aggregated areas (zonal roguing)  
Individually remove randomly distributed vines (rogue)  
Coordinate vine removal & replanting among neighboring blocks  
Consider TCAH breeding habitat (clover, vetch) at landscape scale  
Barrier applications of kaolin clay reduce vector feeding on grapevines





## Typical visual symptoms of grapevine *leafroll* disease (black-fruited cultivars)



## Typical visual symptoms of grapevine *red blotch* disease (black-fruited cultivars)



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