Grapevine Crown Gall: Overview and Prevention

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Crown Gall Disease Outline

- Disease symptoms and description
- Disease management and prevention
- Planting a new vineyard
- Testing requirements
- Statistical sampling

Crown Gall Symptoms

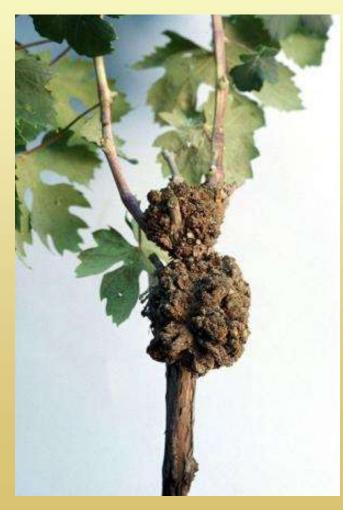




Crown Gall Symptoms

Gall formation on the aerial part of the vines is a common symptom





Grapevine Crown Gall Disease

Causal agent is Agrobacterium vitis

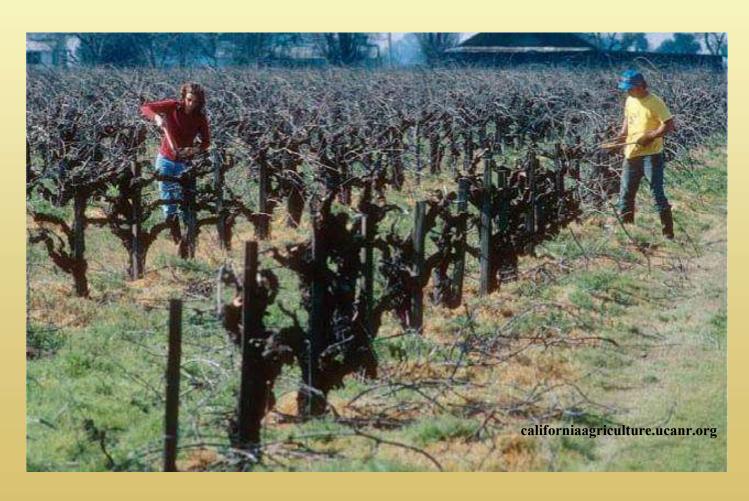
The bacterium can be found in the soil, epiphytically, and in the rhizoplane

Vines could be infected systemically for a long period of time without showing symptoms

Symptoms will appear or intensify after an injury (frost or mechanical)



Disease Management and Prevention



At The Nursery

Statistical testing to discard infected lots:

- Test incoming material prior to propagation
- Sampling plan to assure that vines are pathogen-free

Sanitation Plan:

- Cold storage and grafting benches
- Cutting tools for disbudding and grafting
- Callusing media
- Water baths (change between hydration of different lots)

At the Vineyard

- Plant Agrobacterium-free tested vines
- Avoid planting vines that have been propagated from mothers grown in Agrobacterium-infected areas
- Avoid top grafting with no knowledge of disease status
- Scout your vineyard
- Remove and replace diseased vines (bacteria remains in soil)
- Use drip irrigation
- In cold climate train vines with two trunks

The disease has no cure



Two Trunk Vine Training





Planting a New Vineyard





Plant disease-tested, high-quality grapevines



Test field-finished bench grafts for bacteria, fungi and viruses

Scion Sensitivity

Susceptible

Chardonnay

Merlot

Riesling

Cabernet Sauvignon

Grenache

Many more *Vitis vinifera* varieties

Resistant

- Vitis labrusca
- Some hybrid varieties

Susceptibility and Resistance may vary depending on A. vitis strains

Rootstock Sensitivity

Susceptible

- 110-Ritcher
- Teleki
- 5C
- 420A

Resistant

1103-Paulsen

Couderc 3309

Riparia Gloire

101-14 Mgt

Susceptibility and Resistance may vary depending on A. vitis strains

Planting a New Vineyard Testing Requirement

- Sampling planting material (both rootstock and scion) either certified or not
- Sampling of the previous vineyard (if replanting or top grafting)
- Test for virus, bacteria, and fungal pathogens
- Soil testing (especially if prior diseased vineyard history)

Questions to Ask the Nursery

- When was the increase block planted?
- Are the vines certified?
- Does the nursery have a disease testing and sanitation plan?
- How many vines and how often are these tested? For which pathogens?
- Request analytical reports to learn about testing schedule and history

Common Mistakes

- Planting "healthy looking vines" from a neighbor's vineyard
- Planting pathogen-tested plant material where an infected vineyard was removed
- Top grafting a vineyard with poor performance without knowing the cause
- Removing part of the diseased vineyard to avoid stopping production

Determine the Cause of Decline Prior to Replanting





Disease Testing Project Factors

Sample number will depend on:

- Knowledge of vineyard history (*i.e.*, mother vines can be traced, general health status, rootstock, other stresses, etc.)
- Number of vines in a block and diversity of planting (number of varieties, rootstocks)
- Available budget

Sample Size Varies

Highly Infected Vineyard A few samples will suffice **Healthy Vineyard Planting Many samples are required**





Statistics Needed

When Symptoms are Not Obvious



How many vines to test? (assumes 1% infection)

Number		
of Vines		
in Vineyard	Number	Percent of
Block	to Test	All Vines
100	95	95%
1,000	258	26%
10,000	294	3%
100,000	298	0.3%

How many vines to test? (assumes 5% infection)

Number		
of Vines		
in Vineyard	Number	Percent of
Block	to Test	All Vines
100	45	45%
1,000	57	5.7%
10,000	59	0.59%
100,000	59	0.059%

How many vines to test? (assumes 50% infection)

Number		
of Vines		
in Vineyard	Number	Percent of
Block	to Test	All Vines
100	5	5%
1,000	5	0.5%
10,000	5	0.05%
100,000	5	0.005%

Conclusions

- Start with clean (disease tested) planting material
- Develop a sanitation and disease testing plan at the nursery and vineyard
- Monitor frequently vineyard blocks
- Maintain a good communication with nursery personnel

Thank You!

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Questions?

