

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



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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 Block	Number to Test	Percent of 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 Block	Number to Test	Percent of 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 Block	Number to Test	Percent of 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?

