



ask the

AWRI

## Crown gall in Australian vineyards

The AWRI helpdesk has received reports of crown gall-like symptoms affecting young vines in a number of regions in Australia. A response to this issue is currently being coordinated by an industry response group, with representatives from industry bodies, State Government Departments and diagnostic laboratories. In this article, AWRI Senior Viticulturist Robyn Dixon briefly summarises current knowledge of crown gall disease, acknowledging that scientific understanding of this issue is changing quickly.

### *What is crown gall?*

Crown gall is a significant plant disease globally, primarily caused by two bacterial genera: *Agrobacterium* and *Allorhizobium*, both of which belong to the Rhizobiaceae family. These bacteria lack spores and are closely related to nitrogen-fixing rhizobium bacteria.

### *What are the symptoms of crown gall and how does it affect grapevines?*

Crown gall symptoms include tumour formation, root necrosis, stunted growth and vine distortion. Galls transition from fleshy to cork-like structures, often leading to bark peeling and cracking. Disease progression can cause a decline in vine vigour and eventual

vine death due to girdling. Young vines are especially at risk as galls impede water and nutrient flow. Frost and other injuries can exacerbate symptoms, causing small tumours along bark cracks. In some cases, crown gall symptoms can resemble those of vine strangulation and root knot nematodes, potentially leading to misdiagnosis.

### *What is the cause of crown gall in grapevines in Australian vineyards?*

Historically, in Australian vineyards, *Allorhizobium vitis* (formerly *Agrobacterium vitis*) has been identified as the main causal organism for crown gall. This bacterium is classified as belonging to what's known as the 'biovar 3' group of bacteria. However, since mid-

2022, reports indicate the detection of a different species, potentially belonging to the *Agrobacterium* biovar 1 group, in vines showing crown gall-like symptoms. Prior to this, biovar 1 strains were rarely associated with grapevines. *Allorhizobium vitis* (biovar 3) primarily infects *Vitis vinifera*, while *Agrobacterium* biovar 1 species have a broader host range, infecting more than 140 species. Work is currently underway to identify the causal agent of the recently reported symptoms in Australian vineyards.

### *What are the sources of Agrobacterium and Allorhizobium bacteria??*

Potential sources of these bacteria in vineyards include infected planting material, soil and plant debris (Krimi



et al. 2002, Burr et al. 1995, Dodds and Fearnley 2023). The bacteria can spread from infected vines to healthy vines via pruning equipment and tools and through the movement of infected soil (Dodds and Fearnley 2023). Irrigation, rainfall and flooding may further aid the dissemination of the bacteria and they can also survive on the roots of vineyard weeds or the remnants of previous crops (including the roots of previously planted vines) (Burr et al. 1995, Dodds and Fearnley 2023, Smith 2019).

In established vines, spread may be caused by pruning with contaminated secateurs or through wounds to roots (e.g. by soil-dwelling insects like nematodes, mechanical damage or from waterlogging). In already affected vines, galls can start to develop in any part of the vine from wounds caused by mechanical damage, hail, pruning and frost (Burr et al. 1995, Dodds and Fearnley 2023, Smith 2019). ▶

Crown gall symptoms include tumour formation, root necrosis, stunted growth and vine distortion.

**WINNER!**

**REX4**

**Rex4-120GT  
DYNAMIC  
BEST OF SPECIALIZED**

**Landini CENTRAL**

**WWW.LANDINICENTRAL.COM.AU | ADMIN@LANDINICENTRAL.COM.AU**

**Landini**

**TRACTOR OF THE YEAR 2024  
BEST OF SPECIALIZED  
WINNER**

**Can grapevines be tested for crown gall bacteria?**

Diagnostic laboratories in Australia offer PCR testing for the presence of *Agrobacterium* species. However, this testing does not provide information on bacterial strain or pathogenicity. Work is currently underway to develop new diagnostic tools that will provide more information for growers.

**What can I do to reduce this risk of getting crown gall on my vineyard?**

Site selection plays a crucial role in reducing the risk of crown gall disease. Sites that have a history of crown gall in grapevine and/or other horticultural and agricultural crops present a higher risk. For new vineyard developments, warmer regions with low risk of winter injury and good water drainage are favourable.

**What should I do if I observe crown gall-like symptoms in my vineyard?**

- Photograph and document the location of affected vines.
- Log the symptoms using the AWRI's grower information form.

- For new vine plantings, contact your nursery supplier and the Vine Industry Nursery Association (VINA) on 0429 772 221 or [steve@armnursery.com.au](mailto:steve@armnursery.com.au).
- Contact the AWRI helpdesk on 08 8313 6600 or [helpdesk@awri.com.au](mailto:helpdesk@awri.com.au) for advice on next steps.

**References and key resources**

AWRI. 2024 *Crown gall in Australian vineyards*. Available from: <https://www.awri.com.au/wp-content/uploads/2024/03/Crown-Gall-in-Australian-Vineyards.pdf> Burr, T.J., Reid, C.L., Yoshimura, M., Momol, E.A., Bazzi, C. 1995. Survival and tumorigenicity of *Agrobacterium vitis* in living and decaying grape roots and canes in soil. *Plant Dis.* 79: 677-682

Dodds, K., Fearnley, J. 2023. *Orchard plant protection guide for deciduous fruits in NSW*. NSW Department of Primary Industries, Orange. Available from: <https://www.dpi.nsw.gov.au/agriculture/horticulture/pests-diseases-hort/information-for-multiple-crops/orchard-plant-protection-guide>



Krimi, Z., Petit, A., Mougel, C., Dessaux, Y., Nesme, X. 2002. Seasonal fluctuations and long-term persistence of pathogenic populations of *Agrobacterium* spp. in soils. *Appl. Environ. Microbiol.* 68(7): 3358-3365.

Smith, D. 2019. *Crown Gall of Grapes*. Available from: <https://grapes.extension.org/crown-gall-of-grapes/>

**Acknowledgement**

This work is supported by Wine Australia with levies from Australia's grapegrowers and winemakers and matching funds from the Australian Government. The AWRI is a member of the Wine Innovation Cluster in Adelaide, SA. 



**winetitles media**  
WINE INDUSTRY SOLUTIONS

AU & NZ'S MOST COMPREHENSIVE  
WINE INDUSTRY COVERAGE

















ENGAGE | SUBSCRIBE | FOLLOW | CONNECT

Find us here: [winetitles.com.au](https://winetitles.com.au)    

WINE INDUSTRY SOLUTIONS