

# Canopy damage from herbicides

The AWRI's viticulture team received a query at the start of flowering from a grower concerned about canopy damage observed in their vineyard. The description of the damage and the photographs provided pointed to herbicides as the likely cause of the problem.

**Q:** I'm seeing distorted leaf symptoms and stunted shoots in the canopy. The damage is in sections along the cordon with often healthy looking shoots on either side. I think it might be mites or herbicide drift. Do you have any suggestions?



Figure 1: Stunted shoots and damaged / malformed leaves on a grapevine.

A. The damage shown does not appear to have been caused by bud mites because while symptoms do include malformed basal leaves and stunted growth, with bud mite infestation shortened internodes and zig-zag growth would also be expected.

There are several signs that point to glyphosate drift being responsible for this damage.

Typical symptoms of glyphosate drift onto grapevines include deeply-lobed basal leaves and leaf cupping, both of which are seen in Figure 1.

Inflorescences of glyphosate-affected shoots have also been reported to show unusual characteristics.

Figure 2 shows a closeup of the flowers which are opening from the top of the cap. Longbottom et al. (2008) reported a similar phenomenon in Merlot vines affected by glyphosate herbicide.

The Merlot flowers were identified as being small and immature in appearance and having pink pigmentation at the tip.

Glyphosate is a non-selective systemic herbicide absorbed by foliage and translocated rapidly.

It is possible the necrotic spots on the basal leaves are the result of undervine herbicide application drifting onto green tissue and translocating to other parts of the vine.

The chemical burns the leaves where initial contact takes place.

Alternatively, symptoms of glyphosate damage in spring have sometimes been observed in vines following a post-harvest application the previous autumn.

Glyphosate is known to degrade slowly in plant tissue where it is protected from microbial breakdown.

Dr Melanie Weckert's research at the National Wine and Grape Industry Centre (NWGIC) identified that potted Chardonnay vines could take up glyphosate from soil.

The potted vines were also able to take up glyphosate from the roots of glyphosate-treated weeds in the same pot (M. Whitelaw-Weckert 2013, pers. comm.).

Soils with low potential for glyphosate degradation (limited microbial activity, low clay content or high phosphorus) increase risk of grapevine damage due to remobilisation of glyphosate back into the soil solution and subsequent uptake by the plant.

To confirm if a chemical is responsible for vine damage, analytical laboratories can test for residues in tissue.

If symptoms are extensive across the block, measuring the residue level in fruit at harvest is important for fruit going into both export and domestic wine.



Figure 2: Inflorescence cap uncharacteristically opening from the top rather than lifting off.

To minimise the chance of damage from herbicide drift, use best practice in herbicide applications and pay particular attention to critical comments included on labels such as "Do not allow spray or spray drift to contact bark, leaves, wounds or any other plant parts of any crop as severe injury may occur".

If herbicide damage occurs, water stress should be avoided to give vines the best chance of recovery.

The AWRI acknowledges the contribution of Dr Melanie Weckert (NWGIC) to this article.

**Contact:** For further information, please contact the AWRI viticulture team.

Phone: 61 8 8313 6600.

Email: [viticulture@awri.com.au](mailto:viticulture@awri.com.au).

## Reference

Longbottom, M.L. Dry, P.R. Sedgley, M. Observations on the morphology and development of star flowers of *Vitis vinifera* L. cvs Chardonnay and Shiraz. Aust. J. Grape Wine Res. 14 (3): 203-210; 2008.

Looking for more stories on herbicides? Search our *Grapegrower & Winemaker* article archive at

[www.winebiz.com.au/gwm](http://www.winebiz.com.au/gwm)

