



Promoting grapevine recovery after fire damage

Recent bushfires in regions including the Adelaide Hills, Kangaroo Island and Tumbarumba have seen grapevines in some vineyards damaged by fire. In this column, Dr Mardi Longbottom answers questions about how best to deal with a fire-damaged vineyard.

What is the first priority when managing a vineyard soon after a fire?

Often when a fire burns a vineyard, its effects will be variable, with some vines badly burnt and others less affected or completely spared. When this is the case, the first priority after it is safe to return to the vineyard is to reinstate irrigation to the vines, especially if ongoing dry conditions are forecast. If irrigation infrastructure such as driplines has been damaged, getting it working again is paramount. Temporary irrigation systems such as movable sprinklers or furrow irrigation may be useful as an interim solution to ensure vines receive water.

Can vines be permanently damaged by fire?

Fire may damage grapevines to different degrees depending on the intensity and time of exposure to fire or radiant heat. The major cause of long-term vine

decline or death after fire exposure is damage to the vascular system, which transports water and nutrients (through the xylem and phloem) between the roots and leaves in the permanent structures including the cordon, trunk and roots.

Vascular tissue that is white or green is healthy; tissue that is yellow or light brown is damaged and deteriorating; and tissue that is darker brown is dead (Figure 1). Damage to vascular tissues is permanent. Different levels of damage may occur irregularly around the trunk depending on the duration and location of the fire exposure. Depending on the degree of damage, it may reduce the long-term viability of a grapevine because the flow of water within the xylem to the shoots and leaves is restricted. Significant damage to the phloem will have a girdling effect, whereby carbohydrates generated by the leaves are prevented from reaching and replenishing the root

system. Vines with such damage may start to decline and die in the weeks, months and years after the fire.

Are new shoots a sign of healthy vines?

New shoots may start to appear within weeks after fire damage. In some cases, especially after hot and dry conditions, new shoots may collapse and dry out. This is due to the girdling effect described above. New shoots that grow on the trunk below the fire damage are more likely to survive and, if the vines are own-rooted, can be trained to re-establish a new vine trunk.

What are the options for re-working fire-damaged vines?

It is important to remember that vines will continue to decline during the weeks after the fire and early assessment may not reflect the final status or survival of the vines. If immediate action is taken to cut off fire-damaged vines, this may



Figure 1. A fire-damaged grapevine trunk showing browning of the vascular tissue (left) and healthy grapevine vascular tissue (right). Photo credit: AWRI.

be quicker to perform than waiting until new shoots have started to grow. If the vines survive, and there is sufficient time left in the season, trunks may be re-established in the same season. However, if the vines are badly damaged and do not re-grow, this may be wasted expenditure. On the other hand, there are advantages to waiting to take action. Waiting for signs of vine recovery before remedial action is taken has the benefit that it requires no immediate expenditure and the accuracy of loss assessment will be improved. The disadvantage is that re-growth may occur at varied heights which may be problematic when training decisions are made.

What should I do if my vines are grown on rootstock?

Vines growing on rootstocks pose a challenge for reworking after fire damage. If the rootstock regrows, this may be left to redevelop a new trunk and a scion can be grafted onto this in the following year. Alternatively, if there is sufficient rootstock remaining after the

damaged tissue is removed, a new scion can be grafted close to the ground level.

How should I manage healthy vines after a fire?

When a fire has been through or near a vineyard, grapes on healthy vines may be affected by smoke. If analysis of grapes confirms high risk of smoke taint, the decision may be made not to harvest fruit for winemaking. In such a case, there are some key factors for vineyard managers to consider to maximise performance for the following year.

- **Fruit removal:** Removing fruit from smoke-affected vines early is recommended to maximise vine health and function throughout the season, reduce water demand, minimise pest and disease risk and facilitate pruning.
- **Irrigation:** Avoiding severe water stress will help maintain future productivity. It is recommended to allocate sufficient water to prolong the retention of healthy leaves

throughout the season, which will generate carbohydrates for the following season.

- **Pest and disease control:** Control of pests and diseases is important to maximise leaf area and function until the end of the season. If fungal diseases are allowed to establish and proliferate, disease risk may be higher in the following season due to a build-up of disease inoculum. Growers should continue monitoring for pests and diseases and maintain a regular spray program.
- **Nutrition:** The autumn period is a critical time for the replenishment of depleted nutrients such as nitrogen, phosphorus and potassium. Ideally, nutrients should be applied to moist soil to facilitate their uptake by vines.

For further information on recovery after fire or any other technical questions, contact the AWRI helpdesk on helpdesk@awri.com.au or 08 8313 6600.

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