The trunk diseases eutypa dieback (ED) and botryosphaeria dieback (BD) contribute to grapevine decline, reducing vineyard productivity and longevity, threatening sustainability of the $40 billion Australian wine industry. The causal fungi infect vines through pruning wounds and colonise wood, causing dieback and, in the case of ED, stunting and yellowing of shoots and leaves, eventually killing the vine. World leading research led by the South Australian Research and Development Institute in collaboration with the National Wine and Grape Industry Centre and the University of Adelaide, with funding from Wine Australia, has been developing practical management strategies for grapevine trunk diseases.

Molecular tools have been developed to detect and quantify inoculum in Burkard spore traps. Monitoring of various wine regions has revealed that spore dispersal patterns vary with different climates, highlighting the role of rain and the presence of inoculum over the entire year. This may mean that wounds created during sucker removal and shoot trimming may also be at risk of infection.

Vineyard trials have revealed that wounds were highly susceptible to ED and BD pathogen spores for 2 weeks following pruning, after which the susceptibility decreased sharply. In general, wounds were susceptible to infection by pathogen spores throughout the winter pruning season and susceptibility did not differ between cultivars commonly grown in Australia. These results suggest that there may be little advantage in choosing one pruning time over another, but highlight the importance of protecting pruning wounds for at least 2 weeks post-pruning.

Fungicides provided curative control of ED and BD pathogens when applied to pruning wounds up to 6 days after pruning and inoculation, and preventative control for up to 2 weeks after application. Therefore, a single application once a week may be sufficient to protect wounds, rather than each day following pruning, and could provide a 3-week window of protection to cover the most susceptible period.
Remedial surgery, previously shown to control ED, was evaluated on grapevines with BD. Vines recovered and were able to produce new shoots after remedial surgery, although grafted vines tended to produce shoots from the rootstock rather than the scion. The severity of dieback in untreated vines increased by 5-10% each year, which, with no intervention, would eventually lead to the death of vines. To date, no symptoms have been recorded on vines treated with remedial surgery.

The SARDI germplasm collection located in the Barossa Valley consists of a broad range of Vitis vinifera cultivars sourced from around the world. The collection was visually assessed for symptoms of trunk disease, and cultivars with low disease severity were selected for evaluation of disease progression. Petit Verdot and Muscadelle were consistently the least susceptible to ED and BD pathogens, indicating that they are likely to have the greatest tolerance to infection, with Muscat, Ughetta, Pinot Noir, Riesling, Petit Meslier and Melon also showing potential for tolerance. There was some correlation between cane width, xylem vessel size and colonisation. These traits may be useful markers when selecting for tolerant cultivars or new genotypes.

Water deficit trials subjected grapevines to varying levels of water stress. Inoculating pruning wounds with ED and BD pathogens revealed that increased water stress generally decreased the susceptibility of canes to colonisation, suggesting that drought and deficit irrigation practices may not contribute to the increased prevalence of grapevine trunk disease reported in vineyards. It was observed that fully irrigated vines were most vigorous and as the irrigation treatments were reduced, so too was the cane width, providing further evidence that narrower xylem vessels may restrict the growth of fungal pathogens.

Ongoing research is addressing gaps in the knowledge by developing climate specific recommendations to minimise infection, optimising wound protection and remedial surgery techniques, assessing susceptibility of clones and rootstocks, and investigating infection thresholds for grapevine propagation material. The outcomes will provide localised recommendations to assist growers in making disease management decisions.

Links for further information:


ASVO eKnowledge resource


