

Eutypa dieback

Eutypa dieback is a disease caused by a fungus which grows slowly through the wood of infected grapevines and other woody host plants. Vines become infected through fresh wounds such as those made during pruning. Toxins produced by the actively growing fungus cause stunting of the shoot, though the severity of stunting varies between years and varieties. Two or more years may pass between infection and the appearance of symptoms. It is unlikely that the disease can be spread through cuttings as it appears the fungus itself is isolated to woody parts of the vine.

BY THE TIME SYMPTOMS APPEAR THE FUNGUS IS WELL ESTABLISHED WITHIN A VINE

Damage and loss

The fungus eventually kills infected parts of vines, and can potentially kill the whole vine. While infected vines produce fruit for a time, yields gradually decline, and the uneven ripening of berries as a result of the disease, can reduce wine quality if grapes from infected vines are included in the harvest.

Conditions favouring spore production

Eutypa dieback is unlikely to occur where rainfall is less than 250mm per year and is most common where rainfall exceeds 500-600mm per year. This also applies to vineyards which receive the equivalent in overhead irrigation. The fungus reproduces in areas where 350-500mm or more of precipitation occurs annually. Spores are spread by wind, potentially traveling 100km or more and are present in most districts during wet conditions.

SPORES CAN BE SPREAD OVER VERY LONG DISTANCES; LOCAL VINES NEED NOT BE THE SOURCE

Life cycle and disease development

Where vines or other woody plants have been infected for around 8-10 years, each subsequent winter, masses of 'pimple-like' fruiting bodies are produced on a blackened area of dead wood known as the stroma. Stroma can be found on infected trees and vines on pieces of wood that can break off and remain active on the ground under diseased plants. Spores are released each time the stroma is wetted for 1-2 hours or longer by as little as 2mm of rain or overhead irrigation. Spore production can continue for up to 36 hours if the stroma remains wet, and more spores mature in around 12 days.

SPORE PRODUCTION AND DISPERSAL DEPENDENTS ON THE DEVELOPMENT OF FRUITING BODIES AND THE LEVEL AND FREQUENCY OF RAINFALL OR OVERHEAD IRRIGATION

Spores may be released throughout the year if suitable conditions occur, but vines can only become newly infected during wet weather when spores are splashed or blown onto large wounds that have recently been made. The spores are sucked into the damaged water conducting vessels exposed at the surface of an open wound and can germinate at temperatures between 2 and 25°C. Leaf and shoot symptoms only appear several years later above an infection point.

INFECTION OCCURS IN SUITABLE WET CONDITIONS BUT ONLY WHEN LARGE FRESH WOUNDS ARE PRESENT

Three to four years following infection, cankers are obvious around old infection sites, such as pruning scars. Eventually these cankers develop a flattened appearance with no bark. If an infected cordon or trunk is cut in cross-section a wedge of dead tissue can be seen and can usually be traced back to the canker. Cankers continue to grow around the cordon or trunk of an infected vine, with the wedge of dead tissue increasing as it does until the vine is killed.

CANKERS EVENTUALLY FORM AROUND OLD INFECTED WOUNDS

Susceptibility

All grapevine cultivars are susceptible to eutypa dieback, however, some vary in the severity of the symptoms. Grenache and Shiraz are considered susceptible as the symptoms are more obvious than in some other cultivars such as Riesling, Semillon and Merlot. Chardonnay has high levels of chemicals that assist in wound healing, and this may play a part in its greater tolerance. Despite different tolerance levels eutypa dieback is commonly seen in Cabernet Sauvignon, Shiraz, Sauvignon Blanc, Gewurtztraminer, Muscadelle/White Tokay, Chenin Blanc, Palomino, Mataro and Colombard.

CAREFULLY MONITOR SUSCEPTIBLE VARIETIES: USE THESE AS INDICATORS OF DISEASE ACTIVITY

Other host species

The fungus also infects a wide range of hosts, most of which are trees and many of which are commercial crop trees, common garden and farm ornamentals, hedge species or woody weed plants. In some areas, other host plants may lay adjacent to vineyards. The disease has been recorded on, amongst others, almond, apple, apricot, black currant, Ceonothus, cherry, cork oak, fig, hawthorn, ivy, lemon, Oleander, pear, peppercorn tree, persimmon, pistachio, plum, poplar, quince, rose, sweet cherry, sweet Pittosporum, tamarisk, walnut and willow. There has been no recorded incidence of eutypa dieback in any of the native trees or shrubs (except Sweet Pittosporum), nor on members of the protea family, grasses or conifers.

OTHER WOODY PLANTS MAY BE THE SOURCE OF SPORES OF EUTYPA DIEBACK IN A REGION

Symptoms and monitoring

Affected shoots can be stunted to less than a quarter as long as unaffected shoots, with shortened internodes and small pale yellow/green leaves, which are often cupped and tattered around the margins. Other affected leaves can be speckled with dead areas that may increase in size over time until older leaves develop a 'scorched' appearance. These symptoms will often only appear on one cordon of an infected vine. When normal shoots reach 10-20 cm in spring, inspect vines for stunted shoots and leaf symptoms. These will show up clearly against normal healthy growth. Later in the season, affected shoots can be hidden from view by the growth of healthy shoots on the same vine. Shoots showing mild symptoms of the disease will be particularly difficult to spot later in the season. Flowers clusters and young bunches may appear to develop normally on infected shoots but these will eventually die and shrivel.

MONITOR FOR SHOOTS SYMPTOMS IN EARLY SPRING

If stroma is found in a vineyard, shoot symptoms should already have been visible for many seasons. If leaf and shoot symptoms have been observed, inspect vines during winter, especially wood older than five-years old, for signs of canker development near pruning scars. Symptomatic wood can be sent to a diagnostic laboratory for positive identification of the fungus. Even in seasons where symptoms are mild, if eutypa dieback infection has been confirmed in vines, the fungus remains active and continues to grow. Tag and observe suspected vines. If yellowing of leaves has been noted, and subsequent failure of buds occurs, the suspected cordons should be marked with flagging tape and the nature of the symptoms recorded. Subsequent development of secondary shoots, particularly crown suckers, followed by scorched leaves later in the season should be noted (these symptoms may not all occur in the one growing season). If the disease is present, progression to more obvious symptoms can be expected after several seasons.

EUTYPA DIEBACK MONITORING IS A LONG TERM ACTIVITY

Where to monitor

Look for leaf and shoot symptoms on susceptible cultivars, top worked vines or those with large pruning wounds, older vines, and stressed vines, such as those on shallow or waterlogged soils. These are more likely to show symptoms. Monitoring should be more detailed in these areas, and also adjacent to vines or other vegetation known to be infected by eutypa dieback. It may be useful to use Grenache, Cabernet Sauvignon or other susceptible cultivars as indicators of disease activity, as the disease is most likely to be expressed in these cultivars before more tolerant ones.

Differences between cane and spur pruned vines

In head-trained cane-pruned vines, the basal and distal buds open first, and these become the shoots which tend to exhibit stunting. With spur pruning the disease is more likely to be observed in a cordon. The number of stunted shoots on the infected cordon/s increases over time until the affected part can no longer produce shoots, and dies. Typically, infected vines will contain dead sections along one or both cordons and it is not unusual for one cordon of an infected vine to die before the other.

Control using pruning wound protectants

Wounds larger than a twenty-cent coin should be protected immediately after pruning. The bio-control agent Vinevax® is registered for this purpose and controls eutypa dieback if used strictly as recommended. Carbendazim based fungicides, such as Bavistin®, when painted or sprayed onto wounds will reduce infection and acrylic paints, either alone or mixed with carbendazim, will also form a barrier against infection.

Management using pruning and topworking techniques

Pruning wounds can remain susceptible for 2-4 weeks, so an estimate of likely weather conditions in the month following pruning can indicate the risk factor for infection by eutypa dieback. Pruning tools should always be cleaned between vines, and avoiding horizontal cuts in favour of angled cuts may reduce the chance of infection.

Depending on the severity and location of the infection, only some reworking techniques are effective in prolonging the economic life of a vine:

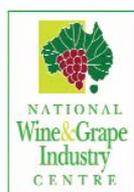
- If it is feasible, saw off the diseased arm of the vine until no discolouration is seen in the cross section, and then saw off a further 5cm below that. Thoroughly soak the wound immediately with a fungicide using a paint brush or spray bottle.
- If the trunk is infected, it may be possible to rework the vine just below soil level to avoid re-infection of the worked vine by the airborne spores of the fungus which causes eutypa dieback.

THERE IS NO CURE FOR THIS DISEASE: AVOID WOUNDING VINES IN WET WEATHER, ESPECIALLY IN WINTER

THE CRC for Viticulture is a joint venture between the following core participants, working with a wide range of supporting partners.



AWRI



Know-how for Horticulture™



PRIMARY INDUSTRIES
AND RESOURCES SA



THE UNIVERSITY
OF ADELAIDE
AUSTRALIA



Victoria
The Place To Be



Winemakers' Federation of Australia
For the Industry by the Industry



Australian Government
Grape and Wine Research and
Development Corporation



winetac
developing people, driving growth