

Dispersal patterns of grapevine trunk disease pathogen spores in Australian vineyards

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Eutypa dieback (ED) and botryosphaeria dieback (BD) are important grapevine trunk diseases causing significant yield reduction and threatening the sustainability of Australian vineyards. The spores (ascospores and conidia) of these pathogens are dispersed by rain splash and wind and infect primarily through pruning wounds resulting in cankers, dieback and eventually death of vines. Understanding the spore dispersal patterns of these pathogens will assist in determining the critical times of the year when spores are abundant in Australian vineyards and will also assist growers in making decisions on optimal timing of pruning and the application of wound protection treatments. The spore dispersal patterns of ED (Diatrypaceae) and BD (Botryosphaeriaceae) pathogens were investigated over 3 years in four wine growing regions in Australia. From 2014-2016, four Burkard spore traps were deployed in South Australia (Barossa Valley and Coonawarra) and in New South Wales (Hunter Valley and Griffith). The spore trap tapes were collected and replaced monthly at each site and analysed by qPCR using group-specific primers for Diatrypaceae and Botryosphaeriaceae spores. ED and BD pathogen spores were released all year round but numbers and species varied between regions, season and year. The ED and BD pathogen spores in South Australia were primarily detected in late winter and in early spring while a high number of spores were trapped over summer in New South Wales. Spores were generally detected during or immediately after rain but not all rain events resulted in spore detection. The spore numbers and frequency of detection varied between years with 2016 having the highest number of spores being recorded, particularly for Diatrypaceae species. Preliminary computer modelling of data showed very weak correlation between other weather factors (temperature, relative humidity, dew point, wind speed), indicating that the spore release may be difficult to predict for these pathogens.

Decision Apps for managing disease in Canola, Wheat and Mungbean

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New decision apps have been developed for managing blackleg and sclerotinia of canola, stripe rust of wheat, and powdery mildew of mungbean. The apps include seasonal risk factors, expected yield, and economics. They give the decision maker the range of possible outcomes that can arise from any management decision, customised for each paddock and season. They are based on all available knowledge from national pathology research projects. They will be updated each year with the latest research findings so that new information can be utilised by industry as soon as possible. The apps are designed for quick and efficient use with clients in the field. They will allow users to make the most profitable decisions about disease management in their crops. The apps are delivered for use on iPads or Android tablets. They have a straight-forward user interface that asks for inputs that can be readily estimated by agronomic specialists. We envisage that the main use case for these apps is as an aid to conversations about disease management between growers and their advisors, and that these conversations typically occur in the field. The BlacklegCM and SclerotiniaCM apps for management of blackleg and sclerotinia of canola are available to be downloaded at no cost from the iTunes store or Google Play. The apps for management of stripe rust of wheat and powdery mildew of mungbean have been field tested this year and will be available for use in the coming growing season.