Fungicides Protect the High Quality of Australian Wines

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Wine grape production in Australia increased rapidly over the past twenty years, primarily driven by strong demand for Australian wine in export markets (Figure 1). The Australian wine industry is the fourth largest exporter of wine around the world. In 2010/11 Australia wineries produced 1.12 billion litres of wine which added $4.3 billion to the nation's economy. The strong growth in Australian and export wine markets is due to Australian wines being of good quality and affordable.

Powdery mildew is a persistent disease of grapevines that is widespread in all Australian grape-growing districts. Uncontrolled, it has the potential to reduce wine quality in most seasons [1]. Wineries may reject whole crops if powdery mildew levels exceed 3% [2]. Powdery mildew is caused by the fungus Erysiphe necator (formerly Uncinula necator) which arrived in Australia in the 1880s, before which Australia was powdery mildew-free [2]. In spring, infected buds produce shoots covered with fungal growth. Wind-borne spores spread the disease. Fungal growth spreads over the surface of vines, slowly killing surface cells. During a series of secondary infection cycles, the fungus spreads throughout the vineyard [1].

In most seasons, four to six applications of fungicides before Christmas are sufficient to control powdery mildew in Australia [3]. Australian grape growers spend about $37 million per year on fungicides and their application for powdery mildew control [3]. As a result of fungicide use, crop losses due to powdery mildew are minimal [2]. Australian research has shown almost complete control of powdery mildew with 5-6 sprays per season [4]. Even under very high disease pressure when 98% of the bunch area of unsprayed grapes was infected with powdery mildew, the fungicide programs reduced the incidence to less than 1% [5].

Wine made from powdery mildew infected berries develops undesirable flavors. Australian research has revealed that even a 1-5% infection leads to compositional changes, an oily mouth feel and undesirable fungal flavors when compared with wines made from disease-free grapes [6]. Diseased grapes had a dusty and mushroom aroma and acid taste compared to the others [6].

References