

CASE STUDY: BIODYNAMIC WINERY

Wine making has been part of Vanya Cullen's family at least since her great, great grandfather planted a vineyard near Bunbury in 1881. Eighty five years later, in 1966, Vanya's parents chose the site of what is now the Cullen Estate vineyard in the Margaret River Region of south west Western Australia; the enterprise now consists of three vineyards: *Cullen Estate*, *Mangan* and *Ellens Ridge*, totalling about 64.5 hectares. Several varieties of red and white grapes are grown and the *Flagship Wines* are the Sauvignon Blanc Semillon, Chardonnay and Cabernet Sauvignon Merlot. They produce approximately 7,500 dozen bottles of these wines each year.

Vanya Cullen is the Chief Executive Officer and senior winemaker for Cullen Wines. Cullen Wines is owned by the Cullen family

Figure 66: The Cullen vineyard in the mild Mediterranean climate dominated by maritime influences



The climate in the Margaret River Region is described as mild Mediterranean dominated by maritime influences. This means that the vineyard is characterised by warmth and ample sunshine; there is some exposure to the north and northeast winds and some tendency for diurnal east-west air convection cells to form due to the lie of the land. The vineyard area is too far north for any southerly influences to dominate. The average annual rainfall is 1150mm.

Although the family had worked hard and made every effort to produce outstanding wine in the early days, the winery was not a financial success until 1994. This was after 23 years of losses with no substantial tax incentives. Moreover by 1987 yields had decreased to uneconomic levels (less than one tonne per acre) because the soil had been depleted of nutrients and was acidic, pH less than 5. The drop in production and the state of the soils prompted the family to research new farming practices and these led them to farm organically.

In 2000 the experienced viticulturalist, Mike Slegers, became involved with Cullen Wines. Mike had an interest in organics and he managed the vineyard through the certification process. The vineyard and winery were certified *organic* by the Biological Farmers Association (now ACO) in 2003 and now it has shifted to *biodynamic* certification. The Cullens found

that the shift from the original minimal chemical input to organic production was more challenging than the later shift from organics to biodynamics.

The restaurant at the winery specialises in using organic and biodynamic produce, including biodynamic vegetables from the Cullen Wines garden.

Carbon neutral. Cullen Wines wish to extend the mantra of the holistic nature of biodynamic farming to other aspects of their business and to minimise the impact of their activities on the global environment. They are moving towards becoming carbon neutral to reduce global warming and Vanya investigated converting the winery to the use of a renewable source of energy (wind) however, the high capital cost of investment and the unreliability of local winds made the commitment unrealistic. Cullen Wines now pays a premium to purchase 100 per cent Synergy Natural Power through the state electricity grid. This power is generated from renewable sources such as solar and wind energies. In an additional initiative Cullen Wines is the first Australian winery to offset carbon dioxide emissions under a programme to plant trees according to calculations of the emissions generated.

Figure 67: The biodynamic preparation BD 500 is applied three times per year



Soils. The vineyard soils are granite and gravely sandy loam overlaying lateritic subsoils. The vines are dry farmed and both pruned and harvested by hand. Vanya realised that management of the soil was essential for nurturing the important old vines in the vineyard and she is pleased with the health of the vines. As the soil improved so did the earthworm population and the colour of the soil changed from grey to rich chocolate. The soil now holds moisture much better than it did before and the vineyard remains green through the dry summer months.

Winery. Although this case study is about the vineyard, it is worth noting that the winery is also managed on biodynamic principles and this includes a specific time for harvest and use of indigenous yeast.

Figure 68: Application of the biodynamic foliar spray BD 501

Sprays. Ground sprays include the biodynamic preparation BD 500 applied three times per year. At times this is combined with fish emulsion and seaweed.

Foliar sprays include the biodynamic preparation BD 501 and sulfur (for powdery mildew) and occasionally copper, as required.

Compost is applied at the rate of five cubic metres per hectare per year. It is made from biodynamic preparations and other materials such as chicken manure, straw, pasture cuttings and grape marc.

Weeds and pests. Weeds are controlled by physical means using an under-vine weeder. The weeder disturbs and remounds the soil and has the added advantage of disturbing the breeding pattern of the greatest pest, the South African garden weevil.



Figure 69: The under vine weeder has the added advantage of controlling South African garden weevil INSET: South African garden weevil



Birds such as silver eye and parrots are a problem and nets are used to protect the vines.

Markets. Cullen Wines are distributed internationally to at least 20 countries and throughout Australia. As Vanya says *biodynamic wines are some of the best wines in the world.*

QUESTIONS ABOUT ORGANIC WINE

What effect do chemicals have in viticulture?

Over-use of artificial chemicals, for example nitrate and phosphate fertilisers, result in less healthy vines.

The vine roots may not grow so deeply, which can affect the flavour of the grapes, and the vines themselves become less resistant to diseases and pests. Soil erosion can also occur, which is disastrous in a system, which cannot include crop rotation. It is estimated that 40 kilograms of chemicals per hectare are used every year in European vineyards. Chemical pesticide used to cultivate conventionally-produced wine, may remain in the wine affecting taste and fermentation.

The low levels of sulfur dioxide found in organic wines reduce the chances of a hangover or of allergic reaction (particularly for asthmatic or bronchial sufferers).

How do you identify organic wine?

Look for the symbol of an independent organic organisation on the label, and perhaps also a note elaborating on this (eg 'Ce vin est cultivé sans engrais chimiques, sans insecticides' or 'Production de l'agriculture biologique'). The Soil Association Symbol can now be used on both British organic wines and also imported wines from countries with standards monitored and inspected by the Soil Association (eg Nature et Progress).

What about quality?

There is an increasing number of excellent organic wines. Most organic wine producers are small holders with limited quantities of wines each year. Organic wine can vary in quality as much as ordinary wine, and the wine importer has to choose the best wines available. Many organic wine producers do not have the finance to keep wine for long periods, so often red wines will improve with storing after purchase.

Is organic wine more expensive?

Organic wine is now much more widely available, so there is a wide range of prices, from cheap to expensive. Cheaper wines usually cost 10-140 per cent more than equivalent conventional wines, but in the case of champagne and other more expensive wines the price differential is often less. The increased premium is due to slightly lower yields than in the case of intensive farming.

Are any chemicals used at all in organic agriculture?

Yes. A few simple pesticides are cleared for use, mainly derived from natural sources. For vines, copper sulphate (Bordeaux Mixture) and sulfur dioxide are permitted to prevent mould growing on grapes. This is not ideal, but they are the least toxic alternatives known and, so far, no other method has been found to prevent the problem. Sulfur dioxide is also allowed during vinification (ie wine making) to prevent the wine turning to vinegar, but organic standards only allow, at most, a quarter of the legal maximum used in other wines.

Are organic wines suitable for vegetarians and vegans?

Conventional wine production permits the use of dried ox blood powder, isinglass (sturgeons' air bladders) or the whites of battery-farmed eggs for fining. (Fining is the process which clears yeast cells, grape particles and any other cloudiness from wine to make it sparkling clear). Most organic producers only use a particular type of clay to fine their wines, but vegetarians and vegans should check with their suppliers.

Home made Bordeaux is not permitted but you can apply for minor use through Australian Pesticides and Veterinary Medicines Authority APVMA.