

Vineyard Sustainability, Report One

Period 26 May to June 2, 2011

Introduction

Of the five mentorship's under Wineskills programme, probably sustainability is the one least well understood. "Sustainable" is an adjective that is quite commonly used today, although it is a relatively recent concept. So far as I know, the origins of the term applied to viticulture were in Europe in the late 1980s and 1990s. The concept of "sustainable viticulture " was developed as an alternative approach to "organic" and perhaps even "biodynamic", with the thought that it was more relevant to both the environment and commercial production. I am aware that it was introduced early in Switzerland, and perhaps other European countries. It spread from Switzerland to Oregon, and from there to New Zealand, California and more recently to Australia and South Africa.

The UKVA has considered the relevance of sustainability to the UK wine sector, and comprehensive details are available on the website . This document contains a nice definition of sustainability in the footnote on the first page. It says "*the core principle of sustainability is that production and consumption continue without compromising the quality of life for future generations*".

The mentorship which I was awarded covered the three conventional "pillars" of sustainable viticulture, being economic, environmental and social, and as well the "task description" added some other considerations. There was a request to specifically focus on the use of agrochemicals and integrated pest management; soil management and nutrient planning; environmental

conservation and biodiversity; energy, water and waste efficiency, and finally, carbon management.

In my first series of visits in May and June I visited nine properties in the South East and South West of the UK.

The Relevance Of Sustainability

I typically began each visit with a discussion of sustainability, and what it meant to me, and then we discussed what it meant to the client. For each visit I conducted a survey with the persons present. I asked them how they might divide the relative importance of the three components of sustainability being economic, environmental and social. I asked them to divide the relative importance up among 100 points, and I had 13 responses. On average, and expressed to the nearest 5%, economic was the most important at 65%, environment second at 20% and social third at 15%. This was quite a consistent pattern with every interviewee marking the economic component in sustainability as being the most important. The highest score for economic sustainability was 80%, and the lowest 50%. For environment, the highest was 30% and lowest 10%, and for social the highest 25% and the lowest 10%.

These results quite clearly reflect the concern among the people I visited (and perhaps the wider UK grape and wine community) that the major challenge in sustainability was for the enterprise to be profitable. This was a common discussion in my visits, where people were concerned with low yields, high costs of production and the problems with very cool climate viticulture in the UK.

For the readers' interest, I attach an economic survey of the impacts of the New Zealand wine industry, see http://www.nzwine.com/assets/sm/upload/v9/q6/e9/ls/NZIER_Rep_April_09.pdf. This report should be of interest to the UK sector at large, and to individual producers, as it documents well the impact of an established wine sector on national and regional economies, tourism, and employment.

I will now discuss the three components of sustainability, and for each list both positive and negative aspects which I saw during my visits.

Economic sustainability

Positive aspects

- There is no doubt that there has been much stimulus to the wine sector from the successes of UK sparkling wines in various competitions. This has led to increases in planting on many properties and a switch to sparkling production for some, and further I understand that there are several new and sizeable developments planned. There is a marketing element to this growth which is outside my brief and which addresses the extent of the potential size of the market for UK sparkling wines at various price points. Of the people I spoke to, there seemed no interest in the charmat method of bulk secondary fermentation.
- A second major consideration is that of the presence of a relatively affluent local population, typically with good wine knowledge. This factor has made the UK one of the leading wine markets in the world. I can think of many Australian and New Zealand wine producers who would dearly love to have such close access to UK wine consumers, which the UK wine producers enjoy.
- There is growing support for the attitude of “*Buy Local*”. In my interviews, I experienced several producers emphasising this as their marketing strategy, which seem to me to be very sound.
- There is a lot of potential vineyard land as yet unplanted. When I compare the UK countryside with its rolling hills to the generally flat landforms seen in my recent visits to Belgium and Denmark, I see considerable opportunities for diversifying UK agriculture into vineyards. While land is expensive, it is not prohibitively so, and several of the people visited had developed long-term leases as a means of acquiring vineyard sites.
- I think the Wineskills program is wonderful, and a great tribute to those persons with the foresight to develop it in the UK. The UK wine sector is a relatively large audience of typically inexperienced persons, with very few businesses into the second generation. The availability of Wineskills

as well as other training at Plumpton College is a major foundation for future growth and economic development of the wine sector.

Negative aspects

- Some of the vineyard properties I visited were quite small by international standards. In Australia and New Zealand for a property selling grapes alone, size is typically around 50-100 hectares. There are few very small vineyards, especially those which have the increased capital burden of both a vineyard and winery as one commonly sees in the UK, and I wonder if there is not a good opportunity in the UK for more wine to be made by contract.
- The vineyards and wineries of the UK are very widespread. In other places where there is a developing wine sector, like Tasmania in Australia, many of the vineyards are in a few regions, which allows the development of a “Wine Trail” which is very useful for promoting tourism and sales. Such developments seem less likely in the UK with the considerable distances between producers.
- The UK is near the cold limit of cool climate viticulture. Using UK climate data for the districts of the South East and the South West, the Mean July Temperature MJT (an index of temperature in the growing season) is respectively 16.8 and 15.7° C. For the two districts the rainfall and rainday number are respectively 780 mm and 120 days, and 1250 mm and 154 days. Of course these values are representative of large districts and many vineyards will have superior figures. However they do emphasise that the UK is a cool and wet place to grow grapes, which introduces its own problems. By way of comparison similar figures of the Mean January Temperature for New Zealand grape growing regions are from 17.1 to 18.8° C, and for Tasmania, the coolest of Australian regions, the values are 16.7 to 18.2 ° C. In mainland Australia, the highest MJT approaches 25° C.
- Because of the climate, UK vineyards are subject to several stresses. The daily maximum temperatures are typically below the optimum for photosynthesis of around 25° C, and, in the spring and autumn, and

depending on site, there is a possibility of damaging air frost. Low growing season temperatures predispose lower sugar levels and higher acidity in the must. Many sites are wind exposed, which has the effect of reducing plant temperature to that of air temperature. Thirdly, wet conditions in combination with low temperatures can lead to fruit set disruption, a common cause of low yields, and the combination of higher rainfall, rain days and high humidity predisposes some fungal diseases.

- Site selection is not always optimised. Some vineyard sites are in hollows which predispose frost problems, and others can be very wind exposed. While sites near the sea have less frost risk, they are often colder due to the ocean temperatures. In very cool climate viticulture, probably the most important decision that is made is site selection.
- There is a common tendency to, in my opinion, overuse foliar nutrition. Foliar feeding has its place, but it is typically costly to use this method to overcome major deficiencies like N, P, K and Mg.
- The majority of vineyard I visited used inter row volunteer or sometimes sown cover crops. I think this practice can be questioned as bare soil makes for a warmer vineyard. Cover crops can be restricted to each second row if they are to be used.
- For 7 of the 9 properties I saw poor vine health and dead vines associated with trunk disease symptoms. This will be discussed later in the report.
- I saw little evidence of nutrient deficiency (apart from magnesium associated with the use of rootstock SO4) in the vineyards I visited. Similarly there was little evidence of downy and powdery mildew.

Environmental Sustainability

Vineyards are acknowledged as causing little environmental impact compared to many other forms of agriculture. The major chemicals used are relatively “soft” fungicides, and there are a few insecticides used, all of part of a highly regulated and environmentally sensitive Government control. Nutrient requirements are generally small. From this point of view, several studies

which have been made of environmental impact of vineyard's have concentrated on soil compaction (due to implement passage on wet soils), and loss of soil carbon in the profile.

Positives

- There was a high awareness of the need to protect the environment for the properties I visited. Most of their concern related to the use of agrochemicals, and other aspects like soil compaction were not so readily appreciated. Interestingly, there seemed a much higher awareness of environment than social responsibility. One property owner visited stated in strong terms that *“environmental sensitivity is no longer an option for modern farmers, it is obligatory”*.
- I am amazed at how many UK vineyards use recycled sprayers. There are very many more in the UK than in Australia! To my mind this is good technology and it is environmentally very friendly, as the spray material which is “off” target is collected and recirculated. I am mindful that these spray units are more expensive than the alternative, and I commend the UK vineyard owners who have opted for this technology.
- I was especially attracted by the biodiversity in English vineyards, although I am not sure that all owners recognise how and why they are so much in vogue with this concept. A glance at the UK countryside shows it to be very different from that of many other places, because the fields are often de-limited by hedges, and sometimes under the hedges are stone walls. These boundaries can be traced back to the Inclosure Acts which took place from 1750 to 1860 and allowed so-called “common” land to be restricted to private use. I am much more familiar in the New World with property boundaries being defined by fences of barbed wire, not to be compared with the biodiversity benefits for both plants and animals of very well established hedges. I am aware that such hedges can be a haven for vineyard pests like badgers and rabbits but one cannot have biodiversity without some such problems!
- Most producers had in place a systematic method of soil and plant testing to guide nutrient application.

- In general there was good practice as to the storage of agricultural chemicals, and to the training of operators for vineyard spraying.
- Several producers collected winter prunings in a wheelbarrow and burned them on site. In view of what I shall say later about trunk diseases, this is a commendable practice.
- One producer used a reed bed to treat winery waste water, and this technology could well be extended to other winery operations.

Negatives

- Some properties had automatic weather stations, but none of them had used data from the stations to predict the need for spraying. There is perhaps understandable concern that disease models developed overseas are not appropriate to UK conditions. Most producers rely on calendar-based preventative spray applications which are inherently conservative, although pheromone trapping for some insects was also used.
- Some properties in urban or semi-urban environments had issues with neighbours. These varied in scope but could relate to noise and odour, and also concern about agrochemical spraying. In other instances vegetation on the neighbour's property could reduce cold air drainage and so increase frost risk.
- Hedgerows could lead to increased cost of pest and weed protection.

Social sustainability

Social sustainability is a component of sustainability that most people seem to be less familiar with. One person I interviewed was however very interested in this topic. He is developing a larger scale vineyard in the midst of large-scale arable farming properties. He notes that arable farming in the area with about 400 acres of cropping employs 0.7 full-time equivalents of a person per year. On the other hand a vineyard can employ seven full time equivalents for 50 acres, with an 80 to 1 difference between the farming options in employment. This person anticipates that a 400 acre vineyard and winery might employ 80

persons. This is a substantial contribution to regional employment, especially in the countryside. The contribution of the grape and wine sector to rural employment could well be emphasised in the UK as it is in other winegrowing countries.

Positive

- The development of vineyards and winemaking in rural communities contributes to employment, both on the enterprise, and with associated wine tourism. An indication of these benefits is provided in the New Zealand study mentioned in the Introduction.
- The development of a local wine sector can help to promote diversity in the local agricultural production. This can also help better use labour where peaks in demand do not coincide.
- Development of local vineyards and wineries can help with a sense of community, and community identity. I have seen many examples of this in Australia and New Zealand.

Negatives

- Grape growing and winemaking can be seen to change the local traditions of land use, and may be resented by some.
- There can be negative effects on direct neighbours through noise spraying and odour.

Grapevine trunk disease

I observed symptoms of these problems on the majority of vineyards. It had previously been unrecognised as a problem, and in some vineyards vines of low health were not observed. While the incidence of trunk disease was high, in the majority of properties seen on these visits, and those subsequently inspected, typically the impact of the disease is as yet limited in individual vineyards. The major problem appears to be *Botryosphaeria*, which is a fungal disease invading pruning wounds made in winter. The fungus grows down the trunk and within two years can kill vines. This is particularly the case with

young bearing vines of some varieties, and older vines tend to be much more tolerant. In most vineyards there was clear evidence of spread.

The disease can under some circumstances spread very rapidly and the key to breaking the disease cycle seems to rest on two factors: removing sources of infection from the vineyard and protecting pruning wounds. Removing sources of infection involves removing prunings or burning them as pruning progresses, and also removal of the sick and dead vines. The second key is protection of pruning wounds and the best means of doing this is currently being evaluated.

Based on my inspections during the two sustainability mentorships, and also other visits to vineyards, I suggested to Wineskills that workshops be held before harvest to advise producers of the problem. These have been held and Wineskills is planning a follow-up program involving international experts.

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