Viticulture

Conditions Required for Vines to Grow

Climate

Vines will grow in a wide variety of climates, and the areas in the world where vines are commercially cultivated continue to expand. Vines will not tolerate excessive temperatures of hot or cold, and therefore most vine growing takes place in temperate regions, generally between 50-30°N and 30-50°S UK is 53°N). They also do best where there is a period of 6 months dormancy and 6 months fruit growing and ripening. They will not assimilate at temperatures above 30°C, and will stop growing at temperatures from 8-10°C. Vines cannot tolerate frosts below -25°C, shoots and flowers will be destroyed if this occurs in Spring, in winter the sap in the trunk may be frozen which then expands and splits the trunk. Various preventative methods can be used to combat this threat - *buttage*, piling soils from between the rows over the base of the trunk, spraying the new buds with water so they frost over and are protected from excessive temperatures, high training to keep the vines off the ground, heaters in the vineyards, fans or helicopters used to circulate cold can also be used. Vines can grow under exceptional circumstances and some semi-tropical regions can ripen two crops per year but the juice is poor and the vines do not live long.

To achieve the best quality grape juice with optimum levels of sugar and acidity, a long relatively cool ripening period is required, although in hot growing regions much can be done to shield the vines from the sun with proper control of the leaf canopy during the growing season. Irrigation is not allowed in EU countries, but where no such restrictions exist, vines will flourish even under very dry conditions.

Soils

Vines will tolerate many different types of soil, with the correct preparation most soils can be made suitable. It is very important to ensure that soils are well draining, as vines will not tolerate very wet roots, often heavy clay soils are avoided. Loose well draining soils are best with a water table that tap roots can use during dry periods. It is essential to team the correct variety with the best soil, this is not fully understood as many new world sites have soil far removed from what the Europeans would consider ideal. Soil structure, in particular humus and organic matter content often requires annual care. Nitrogen, potassium, potash and magnesium have to be checked and adjusted as deficiences or excesses of these minerals can cause problems. The chalk contaent of many soils has proved to be significant in many regions, eg. Champagne and Burgundy, Coonawarra (1m of terrarossa iron rich red soil then limestone in an area 9 miles by 1 mile wide).

Terroir

Bruno Prats, Cos d'Estournel – *"the very French notion of terroir looks at all the natural conditions which influence the biology of the vinestock and thus the composition of the grape itself. The terroir is the coming together of the climate, the soil and the landscape. It is a combination of an infinate number of factors: temperatures by night and day, rainfall distribution, hours of sunlight, slope and drainage, to name but a few. All these factors react with each other to form, in each part of the vineyard, what French growers call a terroir".*

The old world has always closely guarded it regions, splitting and classifying them down to minute areas of excellence. The new world have up till late been more interested in varietal character and what influence this has one the wines quality. Peter Sichel (of

d'Angludet and Palmer) believed that man made quality wine through modern advances in technology, but only a good terroir could make exceptional wines with personality.

Two reasons that the new world has not attempted to delineate areas of quality can be pointed out as being, firstly, the scale of most new world viticulture makes precise delineation either difficult or of doubtful relevance. Secondly there is not enough evidence that it would pay.

Classification of higher quality means higher prices would be charged. Linking classification and terroir in France has led to exhaulted land prices and wines prices. In a sellers market this is good in the short term but dangerous in the long term as it puts the wine out of the reach of many people pockets and therefore confines business growth and opens opportunities for rivals (unless like Mondavi with say Woodbridge and Opus One, he covers all sides). This is why so many Chamoagne houses have started new world wineries, free from classification and terroir. Harvest depends on varieties, and climate in some areas such as Yarra valley (Green Point) where maybe 6 different varietals are grown and harvested separately when each is at optimum ripeness.

The new world countries at present are embarking on laws that guarantee regional area, maybe exact site, vintage and variety not so much grading the quality of a particular area, and leaving controls of yield, training, etc. to the individual winemaker.

The reason that the old world classification system has credibility is that it has been in place for so long, building up over hundreds of years.

Siting of Vineyards and the Creation of Microclimates

In many areas the decision of where to plant and how to train, yields etc, are governed by local regulations, there is little choice. In newer area, careful siting, coupled with correct varieties and design of trelliswork and canopy management can have a profound effect upon the resulting wine.

The proximity of large bodies of water can increase the reflected sunshine during the day, as well as maintaining the temperature during the evenings, moving water can create air currents that reduce the risk of spring frosts. Vineyards on south, or ideally south-east,facing slopes (in the northern hemisphere) receive more heat from the sun as the sun rises in the morning quickly warming the vines which would be in the shade if the slopes faced another direction. In areas with ample sunshine this may wish to be avoided. Soils with a high stone content in the soil such as the Mosel and Châteauneuf-du-Pape, will retain the suns heat long after the direct sunshine has ceased. Careful placement of walls, trees, forests, hedges, ditches (so cold air is channelled out of the vineyard) or windbreaks are all way in which the winemaker can help control vineyard temperature.

Often the word **MICROCLIMATE** is used to indicate the climate of a particular site, or vineyard, whereas **CLIMATE** refers to the general climate of a region, or even a country. Some authorities use the words **MACROCLIMATE** for the regional climate, **MESOCLIMATE** for the site climate and **MICROCLIMATE** for the climate within the vine canopy

Weather Conditions

Whereas the climate is generally fixed to that particular continent of its realtive distance to the seas, oceans, mountains or hills (eg. Bordeaux is maritime climate due to its proximity to the Atlantic). The annual weather can vary greatly, being particularly cold or

wet at various times during the growing seasons, this gives rise to the important differences in vintages.

The ideal weather pattern would be to have plenty of rainfall during winter to boost ground water reserves, followed by a mils spring which would encourage bud burst and successful flowering. The vine needs sunshine to ripen the grapes in summer but should not suffer from water stress so some rain interspersed with sunshine is ideal. Rain at harvest can lead to dilution of must and possible rot so growers always hope for a dry harvest. In cool climates the dryer autumn the better.

Poor weather can cause a number of problems, frost has been mentioned prveviously, which can cause problems of **MILLERANDAGE** and **COULURE.**

- Coulure is a condition where low temperatures during flowering cause incomplete fertilization leading to large scale dropping of unfertilized flowers.
- Millerandage is the condition that follows coulure, where flowers that have not been properly fertilized stay on the bunch, but fail to expand and swell. This can lead to irregular ripening and difficulty in determining a picking date.

Hailstorms can do immense damage over a small area and are unpredictable, although are more common during the early part of the growing season when leaf cover is at a minimum. Rockets containing silver iodide can be fired into the raincloud melting ice and making it fall as rain.

Vines can suffer heat stress and will stop growing at temperatures much above 30°C, above 40°C damage will start to occur, grapes wither and can be burnt by the sun.