Mediterranean climate and viticulture

By Maurizio Gily

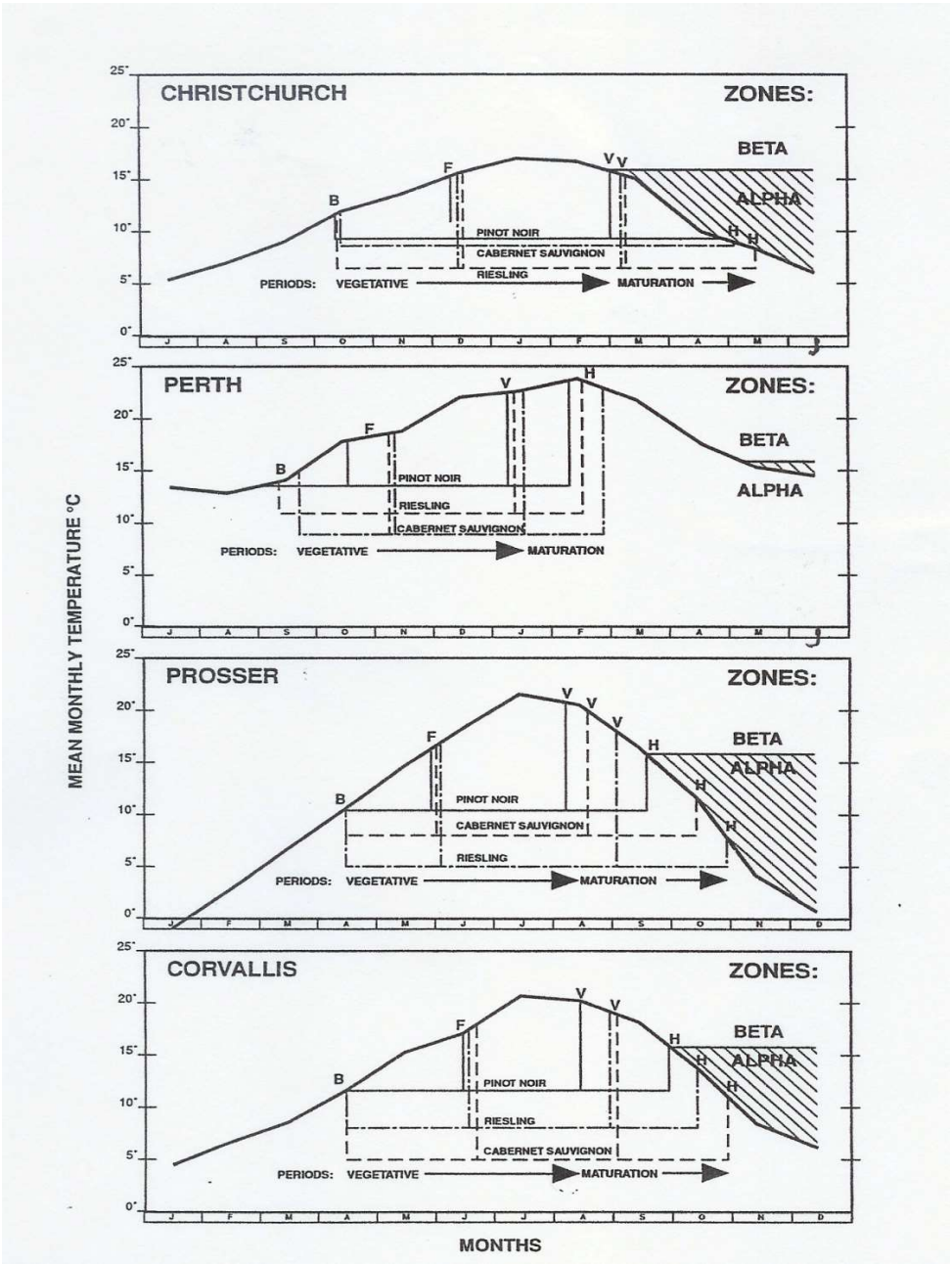
A “cool climate” is the best to get top quality wines from the vineyards: it is a common opinion, especially in English-speaking countries. According with this feeling, the wines from Southern Italy, considered a warm climate land, could certainly aspire to have a place among the "good wines" in the world, but not to reach the heights of excellence, with rare exceptions.
In this short paper I will try to explain why, in my humble opinion, based on my experience and some evidence and recent scientific findings, things are quite different.
We have three key points: the first one concerns the relationship of indigenous varieties with the environment; the second one concerns the environment itself and some clichés about climate of Southern Italy; the third one covers the viticultural "mitigation" of excess heat through the canopy management.

The theory of "cool climate" has solid foundation, both in science and in the experience. What I put into doubt is its generalization: many wines from Southern Italy (but also South of France and Spain), in particular those made from indigenous grapes, tend to escape the rule.

A premise about wine making: the use of cooling systems in the cellar has been the key or their quality revolution; without them, in large masses, producing quality wines in a warm place was almost impossible. This practice dates back few decades: so the modern story (the ancient one is another story) of quality wines of the South is a brief one. A youth which still affects negatively their image. It 's time to dispel these prejudices which still exist.

Vine and environment

With their work and writings, valid scientists like Emile Peynaud in France and David Jackson in New Zealand explained how the viticulture are more qualitative at its "borderline", almost to the limits of possibility to grow vines: at the same time Peyneaud recognized that in these areas the year effect is very strong; therefore the possibility of producing the "great wine" is limited to a few years, while in warmer climates you get more consistent quality, although (in his view) at a lower level. The fact that both Peyneaud and Jackson were sons of a cool-temperate climate (Bordeaux for Peynaud and Christchurch for Jackson) could raise some doubts of impartiality ... In fact, however, is not the point.
Rather the first objection concerns the relationship between grape variety and environment. In a 1993 work published on American Journal of Enology and Viticulture, and widely cited in the literature, Jackson and Lombard compared the climates of some world's wine-growing areas and the period of harvest of three common, worldwide spread varieties. They observe that the best wines are obtained where the grapes ripen in the area "alpha", with average temperatures during the ripening below 15 degrees (Celsius). The maturation at temperatures too hot, explain Jackson and Lombard causes a "misalignment" between the sugar upload (too early), the physiological ripening (sugar / acid ratio, with excessive fall of the latter), phenolic ripening (when sugars are already high, tannins aren’t ripe) the aromatic ripening (with loss of aromatic precursors due to oxidation and respiration) and the color ripening (same problem of aromatic precursors).
In Perth, Australia, all three varieties considered mature too early (beta zone) at the expense of quality, while in Christchurch in New Zealand all three varieties ripen in zone alpha. Jackson, who was a teacher in Christchurch, omits to say that for Cabernet Sauvignon in Christchurch, in a year just cooler than normal, ripening is a serious problems! But the real question is: what are the varieties examined by Jackson and Lombard? Two varieties of cool climates, Pinot Noir and Riesling, and a grape from a temperate oceanic climate, the Cabernet Sauvignon.



By Jackson and Lombard, 1992

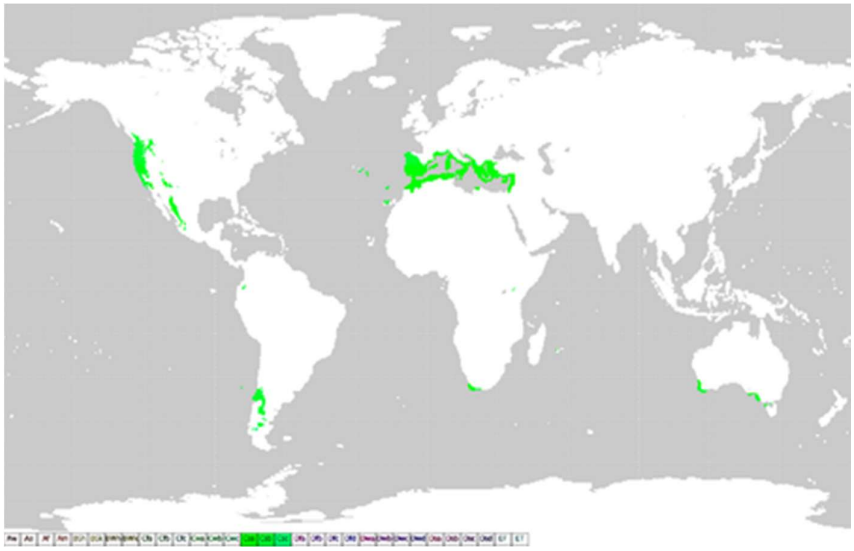
B = budburst
F = flowering
V = veraison
H = harvest

Choice justified by the widespread use of these grapes in the New World: but can we transfer these conclusions in regions where, for their adaptation to the local environment, completely different varieties have established? Definitely not.
First of all, southern varieties are generally later ripening than Cabernet sauvignon, and much later than Pinot noir. They often approach to the area alpha, especially at altitudes exceeding 400 meters (Irpinia,

Vulture, Alta Murgia, Etna); secondly their response to high temperatures is different from that of the Central European grape varieties. They often have high fixed acidity, which make these grapes unsuitable to cooler climates, where they would give too aggressive wines. Then there is a physiological mechanism to consider. During summer peaks of temperatures some varieties, more than others, stop the photosynthesis through the mechanism of stomatal closure, and in doing so they retard the ripening cycle. The stomata are the openings of the leaf through which gaseous exchanges take place, the loss of water vapor and oxygen and the input of carbon dioxide: for this reason the closure of the stomata involves blocking of photosynthesis, which takes over when the temperature drops. In the vineyards of the cooler climates this closure takes place to a limited extent (isohydric behavior), then the basal leaves dehydrate for excessive perspiration and can fall, exposing the bunches to the direct sunlight, which can burn them, and phenomena of over-ripening can occur.
But what applies to the Pinot Noir does not apply to the Negroamaro or Nero d'Avola!

The climate: warm, but ...

Wladimir Köppen is the most famous among modern climatologists. He created a universally accepted classification of the climates of the world. The Mediterranean climate is, in this classification, a subset (s) of the larger group of temperate climates (defined as those where the coldest month has an average temperature between -3 and +18 ° C) and its distinctive feature is a dry season in summer in the respective hemisphere (high sun position).
The mitigating effect of the sea limits the continentality, i.e. the temperature difference between summer and winter, and prevent the temperature from rising too much in summer (except for the occasional presence of sirocco wind from Saharan Africa) while winters are mild.
In addition to the general blandness, the other feature of the Mediterranean climate is, as we have seen, a dry season, with little or no rainfall, along with the warmer months, and a wetter winter season (the exact opposite of what occurs in tropical climates); in any case the annual rainfall is low (less than 600 mm) while the level of solar radiation in the growing season is very high, as the sky is almost always clear: with obvious consequences, among other things, on the health of the fruit and low impact of fungicide defense.
Regions classified by **Köppen** as Mediterranean are of this map.



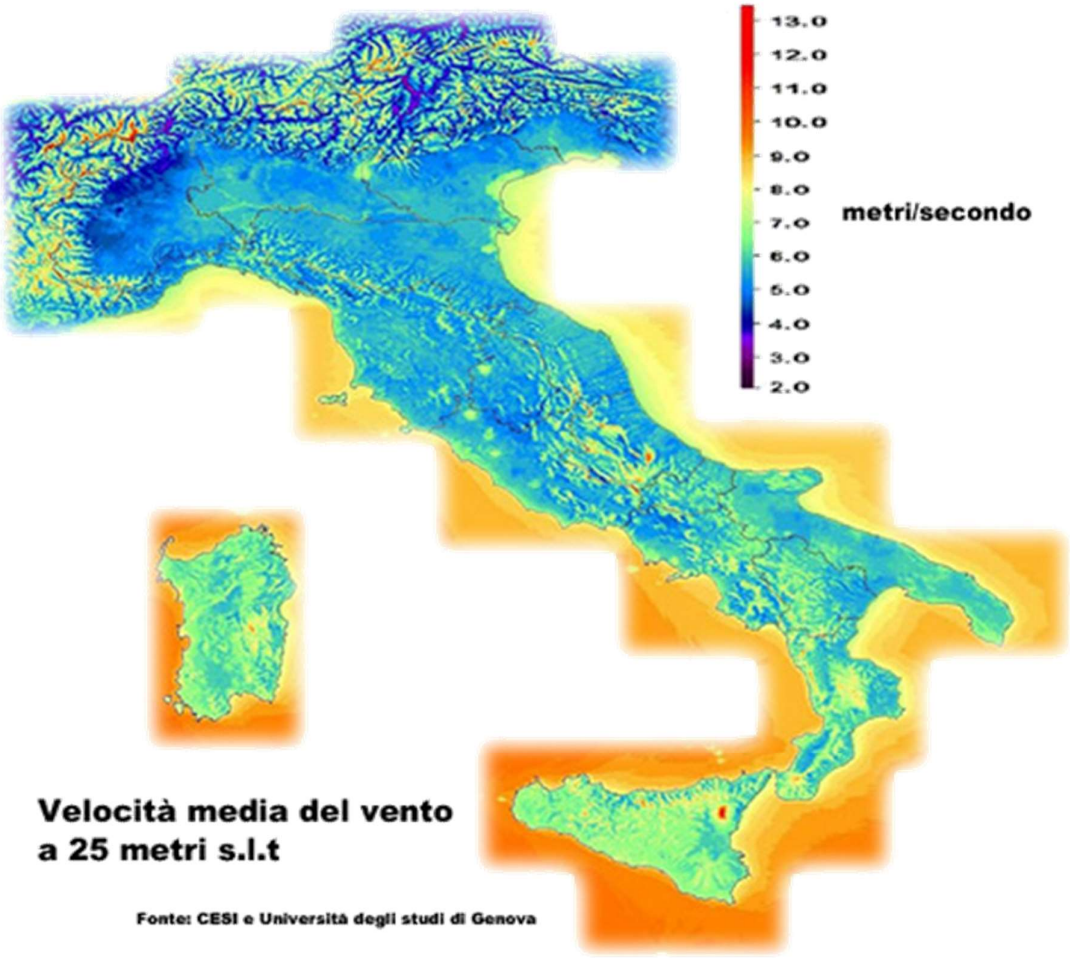
In addition to southern Italy we find south of France and the Iberian peninsula, Greece, the north coast of the Maghreb countries and much of the Mediterranean coast (hence the name), but also California, sub-coastal South Africa, much of Chile, South Australia (Adelaide) and the West (Margaret River). All

traditionally wine-growing regions. It 'a rough classification because there are climatic differences between these areas, especially in terms of temperatures, depending on the latitude and the relieving effect of the sea, stronger in islands and peninsular offshoots as Puglia and Calabria. The South of Italy and France are, in this sense, the Northern Mediterranean.

Mitigating factors heat: the altitude and the wind

Many wine-growing areas in Southern Italy are located at altitude, and this avoids the risk of excessive heat. Among the best known of these wines we find all the wines of Etna, Taurasi, Aglianico del Vulture, most of the Fiano, Greco and Falanghina from Campania, different wines of high ground of the Sicilian mountains and the Apulian Murgia.

For coastal areas is to consider the relieving effect of, as well as the sea, the wind. As shown in the map below, the windiest areas of Italy are South of Sicily and Sardinia, and also Salento is very beaten. The effect of the wind is to standardize the temperature of the fruit to that of air. At a temperature of 35° degrees Celsius (95° F), in the absence of wind, a cluster of black grape hit by the sun reaches and exceeds the temperature of 50 degrees C. (122 F). In the presence of wind its temperature amounted to the same level of that of air (35°). We've all experienced this feature parking a car in the full sunlight in a summer windy day, comparing with what happens when the air is still.



Canopy management to cope with the climate: the bushvine

The tradition of southern Italy, as well as other Mediterranean countries, provides, at least in the warmer areas, only partial exposure of the fruit to direct sunlight. The classic method for achieving this end is the bushvine. Where the soil is more fertile and fresh, as in some areas of Campania, Lazio and Abruzzo, a overhead, horizontal canopy (pergola). The bushvine was partly abandoned in recent decades because not suitable for mechanization and turned into partial VSP (vertical shoot positioning) trellis systems: but often maintaining a form of umbrella in the highest part of the canopy, obtained by leaving the top of the shoots fall downward.

The aromatic precursors

A widespread notion regards the negative effect of high temperatures on aroma precursors and the positive effect of the excursion temperature variation. To highlight the limitations of this dogma we could point out that one of the most prestigious wine-growing areas of the world, the Médoc, Atlantic peninsula, enjoys daytime temperature ranges rather modest. Recent studies have confirmed that excessive heat peaks on the bunches are negative; but, on the other side, some aromatic precursors, in particular norisoprenoids (aromas of tropical fruit and candied) developed better in the presence of mild nights (not too cold), while others prercursors (terpyneols, benzenoids) have opposite behavior. We are therefore in the presence of a complex mechanisms, and not yet fully understood, that suggests to be very careful before embracing easy simplifications.

We can take for example the most adaptable for the climate, among the cultivated varieties: Chardonnay. A Chablis and a Chardonnay from Sicily can be both rich in aroma, but very different for kind of flavors (well, obviously, for the acidity).

I would conclude my paper with the opinion of a Northern Italy man (I live in Piemonte) who have experienced Southern viticulture for a quite long time.

In ancient times the wines of the Mediterranean area dictated the paradigm of quality; in the twentieth century this task fell to the northernmost wine; it's time, in the twenty-first century, to display the character of quality wines of different territories and different grapes (which have been grown for centuries in these lands) using a "flexible meter". They are not better, they are not worse: they are different. In essence, the market has already understood.

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