

# The effects of climate change on wine profiles in the “Loire Centre”



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## Abstract

The effect of climate change is today one of the leading topics in the world. It is crucial for human life and for the sustainability of our planet. The effects of climate change on viticulture are already ongoing with clear impact on current wine profiles. The future trends indicate an acceleration of these effects with even more impact on old wine areas and also chances for new areas.

The Loire Centre region has been chosen, because the amount of published data is limited compared to other well-known regions. Another motivation is that the Loire is my personal favourite.

The key research question is the following: Will the unique character of the world famous Sancerre, Pouilly Fumé and other Loire Centre wines be endangered by climate change or does it offer new opportunities for a sustainable future?

These effects are discussed on worldwide level based on scientific literature. For the Loire Centre, regional data provided by SICAVAC, mostly unpublished, make it possible to address these issues and compare the results with the general trends.

The increase in average temperature during the growing season is also observed in the Loire Centre. However, "Huglin index measurements" in Sancerre (1987-2012) show that most vintages remain well within the critical window, where typical and interesting wines can be produced. This seems positive, but maybe the increase in temperature is not the most significant factor in climate change for the Loire centre region.

Looking at the timing of the grape growth cycle, data from Sancerre show that all stages (budbreak, blooming, veraison and harvesting) have been shifted backwards with at least two weeks. A greater shift for harvesting was observed, compared with the shift of budbreak. Therefore, the period of the growing season and the phenological ripeness period become shorter. This is in line with the overall finding worldwide and has consequences for the wine style.

The Loire Centre, being at the northern limits of the cool climate zones in Europe, seems to be near its optimum growing season temperature, certainly for sauvignon blanc. So they produce high quality grapes at the margin of their climatic limits, resulting in well balanced wines. However, with an increase of 2 °C over the next 50 years, it is possible that this climatic threshold will be exceeded. On the other hand it could push the pinot noir of the region in a more optimal climatic zone. Furthermore, at the same time new production areas can appear. New territories or extension of territories towards the north are possible. This, in combination with new clones of either the same or new varieties, gives new opportunities.

In the Loire Centre, annual precipitation will increase, with the danger to overstimulate the vegetative growth. This is unfavourable for maturation and leads to a lower quality grape. Good canopy

management can solve this problem. More important, the increase in frequency and unpredictability of extremities in weather is the major threat. Severe rainfall and hail events can destroy whole vintages. With improved technology the forecasts can be more accurate.

Supported by temperature and humidity the pest- and disease pressure is increased, which is in line with the general trend. In the Loire region “Les maladies du Bois” are a special burden, which is handled with the way of pruning (Guyot de Poussard).

A decrease in total acidity together with an increase of sugar concentration can be observed. This endangers a good sugar/acidity balance and is a huge threat for the unique character of the white sauvignon blanc. In general, this will potentially produce wines with lower acidity and higher sugar levels, which may lead to a higher alcohol level. Possible solutions are earlier harvesting, acidifying and increased CO<sub>2</sub> levels.

Another solution is to develop new more disease resistant clones of sauvignon blanc that produce higher acidity and lower sugar levels. This new clone could also be combined with another regional grape with a higher acidity, creating a new blend. This last solution is not an option in the minds of the winegrowers..

The reaction of wine growers and experts in the region show that all participants recognize and emphasize the impact of climate change on their wine business and accept that this trend will continue. Furthermore, there is no great difference between the remarks of the experts and the wine makers and there is great consistency in the necessary future adjustments. The most important results:

- Climate change will be a challenge for the sauvignon blanc. However, it will not be impossible to make unique sauvignon blanc wines in 50 years.
- Climate change is an opportunity for the red pinot noir.
- Adjusting the viticulture is more important than adjusting the vinification process.
- New clones of sauvignon blanc or new grafts, coming from mass selection, will be a critical success factor to realize these goals.
- The BIVC/SICAVAC have a databank of clones and new grafts. In this process they make a selection, which is subsequently developed further. There is good contact and cooperation with the wine growers.
- The possibility of a new blend of sauvignon blanc and another regional grape is recognized by SICAVAC, but is a step too far for the wine makers.

Everyone has good confidence that in 50 years time the region will still produce good and interesting wines. For the world famous white Sancerre and Pouilly-Fumé this will be a challenge, but it is possible. For the red pinot noir it is an opportunity. With this the key research question is answered in a positive way.