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Vintage Ratings: Applications of a Ranking Procedure to Facilitate a Better Understanding of Climate's Role in Wine Quality

>>> Four factors that influence wine quality include the grape variety, the environment it is grown in, and the viticultural and the winemaking practices used to grow the fruit and craft the wines[1]. However, being able to separate these factors and define their exact role in wine quality is frustratingly problematic. <<<

■ Vintage Ratings

Determining wine quality involves both sensory and contextual components. For most knowledgeable wine connoisseurs, quality refers to what they personally consider 'good' versus 'bad' wine, and correspondingly desirable versus aversive characteristics. This is usually framed within the context of how the wines conform relative to established, learned norms for the varieties used or wine styles being evaluated. The general wine consumer, on the other hand, often evaluates wine on extrinsic factors such as provenance, producer, variety, vintage, and/or price.

However, since there is no such concept as general or absolute quality in wines, the industry and consumers have turned to tasting assessments that provide a metric for comparing one vintage to another. These assessments, commonly called vintage ratings or vintage charts, are carried out by numerous regional industry organizations, wine magazines, wine writers and other agencies that monitor and value wines. Several entities publish vintage charts that assign a score to each vintage, representing the corresponding perception of the wine quality. However, each institution has its own tasting panel, with its own criteria and perception of quality, which tastes a different set of wines, at different times and under different conditions potentially altering the perception of wines even for experts.

There are several ratings systems in use today. Some use 100 points (e.g., Wine Advocate, Wine Spectator, etc.), others 20 points (e.g., Jancis Robinson, La Revue du Vin de France, etc.), while some use 5 stars (e.g., Vivino), 3 glasses (e.g., Gambero Rosso), or other symbolic forms to indicate the quality of an individual wine or vintage from a producer or region. Unfortunately, there is no standard for these systems, and so no two wine critics or institutions use these systems in quite the same way. As such, simply averaging wine scores across different critic's ratings scales has no meaning; that is, the critics are speaking different languages.

To make vintage ratings more useful as a metric of wine quality, earlier research proposed using a rank aggregation technique[2], which is a tool for combining individual ordered lists into a single "super"-list reflective of the overall preference or importance within the population. Rank aggregation techniques are commonly used in voting theory and web search algorithms, and used in this case it converts vintage scores, generated on any scale, into individual critic or institution rankings, then combines multiple rankings into a consensus ranking for a given wine region or type of wine from a region (i.e., red, white, sweet, fortified).

The consensus ranking procedure[2] has been applied in other studies to help examine the role that climate plays in producing variations in vintages. Applications of the procedure have been done in the following regions.

■ Bordeaux[3]

➔ Bordeaux ratings for red and sweet white wines (i.e., Sauternes) from eight sources
➔ Daily climate data summarized by regional grapevine phenological stages
➔ Comparisons between the 10 highest and 10 lowest ranked vintages during 1961-2009
➔ Top ranked vintages exhibited higher average growing season temperatures, higher heat accumulation, higher temperature diurnality, and dry conditions, particularly during véraison
➔ Differences between wine vintage rankings indicate that drier and sunnier conditions during bloom are especially important for white grapes grown in the region and used for sweet wine production

■ Tuscany[4]

➔ Chianti ratings from six sources
➔ Daily climate data summarized by regional grapevine phenological stages
➔ Also examined weather type frequencies over the region
➔ Comparisons between the 8 highest and 8 lowest ranked vintages during 1961-2009
➔ Top ranked vintages exhibited higher average growing season temperatures and higher heat accumulation, more days over 35 °C from fruit set to véraison, lower humidity levels during the growing season, and a general lack of rainfall, particularly during véraison to harvest
➔ The weather type most frequent during top vintages was anticyclones over central Mediterranean Europe, while bottom vintages experienced cooler continental and cyclonic weather types

■ Port (Douro Valley)[5]

➔ Vintage Port ratings from eight sources
➔ Daily climate data were divided by average grapevine phenological stages
➔ Comparisons between the 8 highest and 8 lowest ranked vintages during 1980-2009
➔ Results showed that growing season mean temperatures above the region's average, but cooler conditions pre and post véraison lead to vintage declarations and the best ranked vintages
➔ The models also showed the ability to predict vintages not yet rated, correctly placing the 2010-2014 vintages in the top, middle, and bottom ranked vintages

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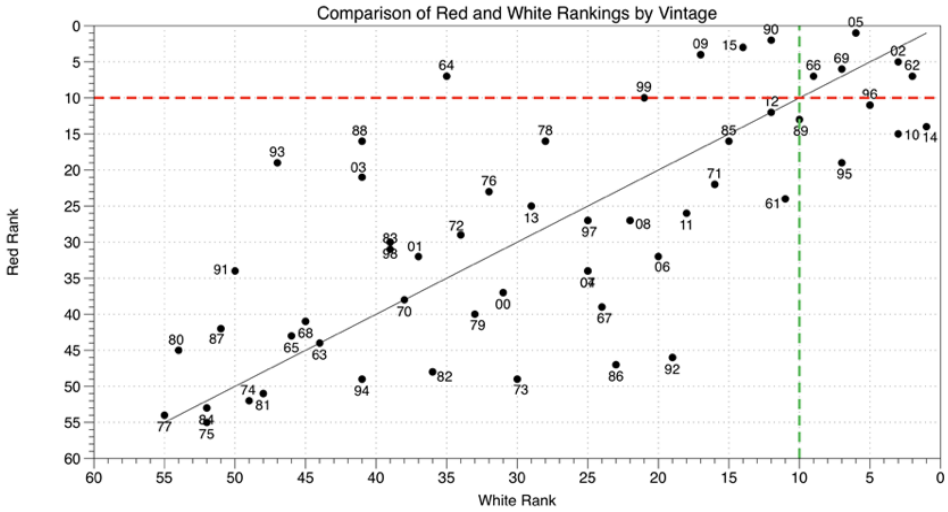


Figure 1. Comparison of Burgundy red and white vintage consensus rankings[6]. Dashed red and green lines identify the top 10 red and white vintages, respectively, and the 1:1 line is included for reference.

■ Burgundy[6]

➔ Burgundy red and white wine ratings from 12 sources
➔ Daily climate data organized by long term average Pinot Noir phenological stages observed at Domaine Louis Latour
➔ Figure 1 shows the comparison of red and white consensus rankings by vintage. The results show that there can often be large ranking differences between red and white wines (e.g., 1964)
➔ The most important climatic factor in distinguishing between top- and bottom-ranked vintages is simply warmer vintages (warmer average growing season temperatures or higher heat accumulation), however, for red wine higher than average diurnal temperature ranges are most important, while moderate maximum temperatures during the season are most important for whites
➔ In addition, the best Burgundy vintages (red and white) are also more likely when there is ample rainfall during the late winter/early spring and dry conditions during the véraison and ripening phases

■ Summary

The ranking method of utilizing multiple vintage rating sources to develop an impartial consensus of the collection of input scores has proven useful for the research community, providing a relative measure of wine quality. The results from four applications of the method in Bordeaux, Tuscany, Portugal, and Burgundy help to define climate's role in vintage variations. The common positive effects for top vintages across the regions include wet late winters/early springs, warmer growing seasons (1-2 °C or 20-30 % higher heat accumulation), higher diurnal temperature ranges, and drier late seasons heading into harvest. Common negative effects for bottom vintages across regions include shorter and cooler seasons, lower diurnal temperature ranges, and more precipitation during ripening.
Marginal effects from these studies point to a 50-60% increase in the probability of a top ranked vintage with 1 °C above average growing season and a 35-45 % increase in the probability of a bottom ranked vintage with a 1 °C below average growing season. However, these marginal effects also indicate that the role of some climate factors, or even individual weather events, can take a warm vintage and move it into one of average quality. The lower marginal effect from a cooler vintage also indicates that not all cool vintages are equal where if other climate factors are favorable (e.g., diurnal temperature range, lack of precipitation during ripening), then a higher quality vintage is possible. Also, the research did not examine potential limits to warmer growing seasons[7], whereby additional heat stress may turn an exceptional vintage into one that is average or of poor quality.
Wine quality will always be hard to define, personal, and therefore, subjective. Wine quality is likely much easier to detect in general, than to define in any logical or reproducible way. As such defining wine quality in terms of its chemistry will never be more than partially successful. This research has provided a non-partial method using expert opinion to better define vintage quality. The method also allows further assessment of climate's role in wine quality, confirming to some degree what we already inherently know: ample precipitation during the winter and spring, warm vintages with cool nights during ripening, and dry conditions leading up to harvest offer the best chance for a good vintage. ■

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