



Willingness to Pay for Personalized Wine Advertising: An Experiment with *Bourgogne* Wines¹

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1. Introduction

More than other food markets, the wine French market is highly segmented (Bazoche et al., 2009), and unreadable for consumers trying to objectively and/or subjectively make choices, within limited attention and time constraints. In order to capture consumers' attention, within a very large number of substitute brands, generating consumer awareness or confidence is a challenging task, and few wineries can afford to spend money on creating awareness through advertising and alternative, effective methods of communication with their target market. In addition, while asking themselves for proofs of attention from businesses, consumers are slowly being convinced of the customizability of all products and services, which renders the *capturing the attention* task is even more compelling for vineyards. Consequently, the wine producer able to capture consumers' attention through the provision of more personalized advertising is better positioned to succeed, especially if this is implemented through simple and inexpensive techniques.

Although speaking of *brand* in the French wine market still needs clarification, we may conjecture that efforts of personalization in image construction, advertising, communication that a wine producer is putting into practice around the wine, its label and its production can be analyzed in similar terms as brand personalization. Considerable attention has been devoted in marketing to brand personalization (Aaker 1997; Johar et al. 2005). In short, researchers have suggested that brand personality is a vehicle of consumer self-expression (Belk 1988) and therefore consumers' attention can be captured through several attributes, among which sincerity, excitement, competence, sophistication, and ruggedness (Aaker 1997). More and more wine producers tried to personalize their wines and capture consumers' attention by advertising on one of these attributes, by highlighting environmental commitment, soil preservation or mysterious discoveries. Considering that involvement in an advertising direction is intended for long term image credibility construction, it is a crucial choice for the vineyard to highlight only one of these attributes and construct the image of his wines on it (as consumers' attention is scarce, the perceptible focus has to be unique). This brings an additional difficulty as long as the vast majority of wine producers in the Burgundy area indeed declare being involved on all these 3 dimensions (soil, environment, and discovery). The implication could be uniformity in stated involvements and therefore our interest is in evaluating a differentiating signaling related to the vineyard personal trails. This corresponds to a reasonable expense investment, but must be supported by a specific *aura* of the wine producer (not easy to reach).

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This paper is therefore an attempt to contribute to the debate about label signaling and involvement signaling by studying how consumers value alternative stated involvements among wines, with a special focus on wine producers who personalized through communicating on their own. To avoid hypothetical biases in consumers' evaluation of the wines, we used an incentive compatible elicitation method, the Becker, DeGroot, Marschak (BDM) mechanism (Becker et al. 1964), based on real sales with random selected prices, and constructed our experiment on the basis of those described in Bazoche et al. (2009).

We review the theoretical bases of our work in Section 2, describe the experimental design in Section 3, present results in section 4 and discuss and conclude in Section 5.

2. Willingness to pay for personalization of the wine and wine producer willingness to personalize a label

What should explain the differences in consumers' willingness to pay for a wine? Among some other reasons, it should be the influence of the stated involvement signaled through brand personalization (Aaker, 1997). Could then the price of a wine be increased only as an effect of a specific focus in advertising through the website or the booklet? The answer is yes and relies, on the one hand, on an extension of framing effects (Tversky and Simonson, 1993), and, on the other hand, on the fact the perception and valuation of an experience with a wine is determined by sensorial and beliefs processes (Lee and Ariely, 2006). In particular, consumers' perceptions, choices and elicited prices depend on what is information about the wine composed of, but may also be affected by the type of information that directly *speaks* to consumers, i.e. the hypothetical relation they identify between them and a wine producer on the basis of the message the producer addresses to them.

Establishing such a special relation is easier when the consumer can physically identify the producer releasing the message, and therefore this variant of the personalization concept can convey a premium in the value of the wine, according to the consumer. The consumer attaches the higher degree of attention in such a product, and s/he believes that the producer is really speaking to him/her. Additionally, in the area of neuropsychology research, we know that the consumer activates more neural centers in the brain when viewing a face rather than a figurative image. Therefore, among *research*, *experience* and *credence or beliefs* attributes identified in the theoretical work of Nelson (1970), Darby and Karni (1973), these inferences are based on the valuation of credence attributes extracted from personalization.

Willingness to pay for credence attributes is revealed here through a laboratory experiment constructed on the basis of Bazoche et al. (2009) or Lange et al. (2002) procedure, using typical real sales through auctions (see Lusk and Shogren, 2007, for an extensive review on price elicitation techniques). It was important here to adopt such a methodology, since market data on the marginal effect of label personalization are not available. Indeed, some consumers derive utility from buying personalized wines, such as wines strongly linked to the image of the vineyard, or, on the contrary, wines exacerbating soil or environmental attributes. As such personalization are costly to vineyards, means of verifying its impact on the price are necessary in order to make sure it functions efficiently, because consumers can ask themselves whether particular marketing practices were used. In particular, according to the personalized image created, the wine's overall perceived *quality* will change, as well as subsequent coherent consumption choices, and therefore the price. Consequently, some wine sellers can consider that personalizing the wine induces an increase in the perceived wine quality and consumers willingness to pay for it, and therefore expect a price premium, as long as a *minimum standards personalization* is binding on the market (for instance *everyone* respects environment).

In line with Grolleau and Caswell (2006), if consumers perceive a correlation between a personalization attribute, such as the image of the vineyard, or the soil preservation involvement, and other wine attributes they can evaluate (flavor, quality, price...), the efficiency levels of such supporting attributes can be a substitute for direct relation with the wine producer. Understanding of the impact of personalization on willingness to pay for wine is related to the analysis of the overall information available to consumers (contextual, visual, tasting, monetary...). Wine consumers are likely to value differently alternative personalization dimensions, because they fix their attention on different attributes. Wine producers are likely to take this into account when searching for consumers and defining their market target. Caswell and Mojduszka (1996) argue that an experience or credence attribute can be transformed into a search attribute via labeling, and label can become salient through personalization. Credence attributes, such as personalization, are difficult to induce because the cost of defining, measuring, and verifying them can be high. A potential remedy to the measurement problem is to use a signal (a short-cut for attention). Consumers can search for a specific attribute and well-personalized labels can serve as cognitive supports that economize on the attention of consumers and on transaction costs (Valceschini, 1999; Wynne, 1994). An essential element of this decision problem is to measure the extent to which different personalization attributes influence choices and willingness to pay.

In line with Lancaster's (1966) framework, and adapting Grolleau and Caswell (2006)'s model on eco-labels to wine and its credence attributes, the consumer's utility from buying wine is not determined by the wine itself, but by the other characteristics the wine provides. Here these characteristics are both the credence personalization characteristics through producers' involvement signaling, and the wine's related search and experience characteristics. To model the choice between two wines, assume the typical consumer derives utility from: (a) consuming the characteristics of the two wines – a wine X endowed with environmental attributes, available at a price P, and a wine X' personalized through vineyard personal trails signaling, available at a price P'; and (b) consuming the quality improvement in the information due to the personalized message.

Several factors play a role in the consumer's utility: the utility resulting from the consumption of the experience and search attributes of X or X', i.e., $\partial U/\partial X$ versus $\partial U/\partial X'$. Most generally, $(\partial U/\partial X' - \partial U/\partial X)$ could be positive, zero, or negative; the informational environment improvement resulting from personalization of X or X', i.e., $\partial Q/\partial X$ versus $\partial Q/\partial X'$; the utility resulting from informational improvement, i.e., $\partial U/\partial Q$.

Assume that consumer's utility increases with consuming the wines X ($\partial U/\partial X > 0$) or X' ($\partial U/\partial X' > 0$), and feeling comfortable (because they understand) in the informational environment ($\partial U/\partial Q > 0$). As noted above, the *environmental* labeled wine could have related search and experience characteristics that are better, equivalent or worse than the *personal vineyard trails* labeled wine. Moreover, we assume that X and X' are both harmful to the informational environment ($\partial Q/\partial X < 0$ and $\partial Q/\partial X' < 0$, because generalized specific labeling decrease the credibility or specificity), but X' is less harmful than X because it is more difficult to support a vineyard trails label personalization (and therefore less vineyards are likely to do it because of lack of *aura*) than environmental personalization (in which most wine producers are indeed involved and just have to say it). The quality in information understanding Q is decreasing with X and X' but more slowly with X' than with X, so that $\partial Q/\partial X < \partial Q/\partial X' < 0$. The marginal improvement of information understanding with X' is $\partial Q/\partial X' - \partial Q/\partial X$. Because of differences in related search and experience characteristics, the expected utility from consuming X' can be higher ($\partial Q/\partial X' > \partial Q/\partial X$), the same as ($\partial Q/\partial X' = \partial Q/\partial X$), or less than ($\partial Q/\partial X' < \partial Q/\partial X$) the expected utility from consuming X.

Under these assumptions, the consumer's problem is a standard maximization of utility $\text{Max } U(X, X', Q(X, X'))$, under a constraint of money $PX + P'X' = I$, where U is a quasi-concave utility function

and I is the consumer income (dedicated to wine expenses). The Lagrangian function is therefore written as $F(X, X', Q, \lambda) = U(X, X', Q(X, X')) + \lambda (I - P * X - P' * X')$, where λ is the Lagrange multiplier. The partial derivatives are usually computed as $F_X = \partial U/\partial X + \partial U/\partial Q * \partial Q/\partial X - \lambda P = 0$ and $F_{X'} = \partial U/\partial X' + \partial U/\partial Q * \partial Q/\partial X' - \lambda P' = 0$ and $F_\lambda = I - PX - P'X' = 0$. We therefore obtain $F_X - F_{X'} = \partial U/\partial X' - \partial U/\partial X + \partial U/\partial Q * (\partial Q/\partial X' - \partial Q/\partial X) - \lambda * (P' - P)$. If $\partial U/\partial X' - \partial U/\partial X > 0$ and $\partial U/\partial Q * (\partial Q/\partial X' - \partial Q/\partial X) > 0$, then $P' - P = \alpha > 0$, as consumers are willing to pay a premium α on the vineyard trails personalized wine, $\alpha = P' - P = ((\partial U/\partial X' - \partial U/\partial X) + \partial U/\partial Q * (\partial Q/\partial X' - \partial Q/\partial X)) / \lambda$, with $\lambda = (\partial U/\partial X + (\partial U/\partial Q * \partial Q/\partial X)) / P = (\partial U/\partial X' + (\partial U/\partial Q * \partial Q/\partial X')) / P'$.

Due to the need of supporting by an aura a vineyard trails personalization, we assume that the configuration for the wine market is such as this type of personalization incurs higher costs. Here the marginal overall cost of X', is greater than that of X. Therefore, a wine producer will personalize on its own trails only if the difference between the marginal costs of the two wines is strictly less than α , i.e., the marginal value of the utility resulting from vineyard trails personalization improvement of the last unit ($\partial U/\partial Q * (\partial Q/\partial X' - \partial Q/\partial X)$) plus the marginal utility resulting from the increase of related search and experience attributes of the last unit ($\partial U/\partial X' - \partial U/\partial X$). In addition to the marginal costs, this wine producer frequently entails other costs (e.g., specific decoration, training and advertising) requiring marginal costs to be further below α to induce personalization on his own trails.

If the difference between marginal costs is higher than α , the costs incurred to personalize on his trails would be too high and the producer will only communicate on X (environmental involvement). On the contrary, if this is lower than α , then the price for the personal trails wine would be low enough that he captures the whole demand and there is no demand for X. Finally, if marginal costs are equivalent, the consumer could be indifferent between consuming the two wines. Nevertheless, rational consumers may always prefer consuming a wine from a vineyard with whom he has a relationship!

The likelihood of personalizing the wine on personal trails and supporting the subsequent extra costs depends on the value of α , which is shaped by consumer preferences. Table 1 shows several cases related to the interaction of different types of attributes.

		1	2	3	4
		$(\partial Q/\partial X' - \partial Q/\partial X)$	$(\partial Q/\partial X' - \partial Q/\partial X)$	$(\partial Q/\partial X' - \partial Q/\partial X)$	$(\partial Q/\partial X' - \partial Q/\partial X)$
		high	low	high	low
		$\partial U/\partial Q$ high	$\partial U/\partial Q$ high	$\partial U/\partial Q$ low	$\partial U/\partial Q$ low
A	$(\partial U/\partial X' - \partial U/\partial X) > 0$	+++	++	+	+/-
B	$(\partial U/\partial X' - \partial U/\partial X) = 0$	++	+	-	--
C	$(\partial U/\partial X' - \partial U/\partial X) < 0$	+/-	--	--	---

Table 1: Likelihood of personal trails personalization of wine for different levels of search, experience and credence attributes

First, consider the situation shown in row B where the level of related search and experience attributes of the two wines is equivalent ($\partial U/\partial X' - \partial U/\partial X$ is zero) and the exclusive focus is on the effect of personalization of the label ($\partial U/\partial Q * (\partial Q/\partial X' - \partial Q/\partial X)$). This is the situation analyzed if attribute interactions are ignored. There are four cases:

Cell B1. Personalization on himself generates a high quality improvement in information understanding by consumers, and consumers value it highly (because of an important increase in readability of the wine market). The overall impact on α is significant, and wine producer will be likely to personalize his label on himself.



Cell B2. Personalizing on himself has a low impact on information quality, but consumers value this small impact highly. The overall impact on α is significant, and wine producers may be likely to do it even though the overall improvement in readability is modest.

Cell B3. The readability improvement in the market offer resulting from personalizing on the vineyard himself is high, but consumers place a low value on this change in information quality. The overall impact on α is weak. Creating such a personalized label can improve the quality of the information significantly, but the wine producer may not be willing to do so.

Cell B4. Creating such a personalized label implies a small improvement in information quality, but consumers do not value the improvement. The overall impact on α is insignificant, and wine producers will be unlikely to personalize the label in such a way, because this will not be valued.

There are two other interesting cases. There is the situation where the level of related search and experience attributes of X' is higher than that of X ($\partial U/\partial X' - \partial U/\partial X$ is positive). In all four cases (cells A1-A4), the higher level of related search and experience attributes for X' has a positive impact on the likelihood that vineyard trails personalization can be created compared to the base case of no difference in these attributes (cells B1-B4). Of particular interest is cell A4. If both the effect of the informational readability improvement ($\partial Q/\partial X' - \partial Q/\partial X$) and the valuation of the improvement ($\partial U/\partial Q$) are low or close to zero, such a personalization in label may still be created if the search and experience attributes are significantly better than for X . There is also the situation where ($\partial U/\partial X' - \partial U/\partial X$) is negative, i.e., the level of related search and experience attributes of X' is significantly lower than for X . In all cases (cells C1-C4), the lower level of related search and experience attributes for X' has a negative impact on the likelihood the vineyard trails personalization will be created compared to the base case of no difference in search and experience attributes (cells B1-B4). Cell C1 is an indeterminate case. The combined effect of a high informational improvement ($\partial Q/\partial X' - \partial Q/\partial X$) and the high valuation of the improvement ($\partial U/\partial Q$) is likely to encourage the creation of such labels. However, the lower level of related search and experience characteristics is likely to discourage such creation. The stronger effect determines whether the label is personalized in this way.

3. Experimental design and method

The experiment is based on the protocol developed by Bazoche et al. (2009), Lange et al. (2002) and Combris et al. (2001, 2006). Experiments were conducted in Dijon (France) with red Bourgogne wines.

Recruitment of participants: The 24 participants selected for our pilot experiment had to be wine drinkers (drinking wine at least once a week), be involved in their household wine purchases and not have taken part in a marketing or consumer study in the previous three months. Subjects were offered a monetary compensation to participate in the experiment and an endowment to buy the wines. Each participant was sent by email information about how the experiment would be conducted, in order to be sure they fully understand the auction mechanism.

Choice of Wines: Four Bourgogne wines were selected for the experiment on the basis of professional experts' advices and recommendation from The Wine Advocate. The wines were chosen in order to be relatively close substitutes for their experience attributes, each one having a typical set of credence attributes, related to personalization. The A wine, is a Bourgogne, les Bons Batons, 2005 bottle, produced by Philippe Leclerc in Gevrey Chambertin and it represents the most personalized wine on the vineyard typical trails. Philippe Leclerc is, as reported by several famous wine critics, "his own man", has very high score wines, all communication is built around his real pictures and personal advices and stories, bottles are not similar to ordinary Burgundy bottles, back labels are handwritten and signed (see Appendix). The market price of this bottle is



12 euros. The B and D wines come from domaine Prunier, in which the producer made the choice to change the type of label and speech around their wines (from D to B). The D wine is Auxey-Duresses Le Val, is tradition labeled. The B, Saint Romain la Combe Bazin, is environment and modern labeled. Bottles are at 16 and 10 euros respectively. The C wine is a Terra Incognita, Macon Rouge, bottle, and is discovery labeled, the selling price being 7 euros.

Session: The experiment was conducted in the Burgundy School of Business, at the LESSAC lab, in March 2009. Participants took place in individual cells such as they could not communicate with each other. The four wines were first evaluated after blind tasting (situation 1), then after examination of the bottle and tasting (situation 2), and finally after examination of the bottle, tasting and examination of additional messages (situation 3). Half of the group benefited from commented tasting with enologists, half of the group with student members of an enological association. They had a glass of water and some bread to take away the taste of the wines between each tasting. After tasting and/or examining each wine, participants wrote down their maximum buying price for the wine on a form. They were told to do it carefully, imagining that this wine could be the one sold at the end of the experiment. They could indicate that they did not want to buy the wine by ticking a box. Forms were collected by the experimenter after each individual evaluation. Participants tasted or visually assessed each wine sequentially. Each wine was served in a glass (20 ml per glass) at a temperature of $15 \pm 2^\circ\text{C}$. At the end of the session, a common price was randomly drawn to select the selling price for each wine and a number to select the situation. When the selling price was lower or equal to the maximum buying price a consumer indicated for a wine, he had to buy the wine at the randomly drawn selling price. If the random selling price was higher than her maximum buying price, he did not buy. So participants had an incentive to indicate a maximum price they would not regret, whatever the actual selling price.

In conclusion, the experiment was intended to test the following main hypotheses:

H₁: *Personalizing on the vineyard trails will have a higher impact on consumers' willingness to pay for the wine than other personalization dimensions (discovery, soil preservation) over standard environmental label personalization.*

H₂: *Consumers coached by experts will over-value wines.*

4. Data and results

Each of our 24 participants submitted 12 bids, which results in a total of 268 observations. In this section, we present several categories of results, to describe the procedure or to measure the concordance with our hypotheses.

R₁: *Excepting the blind testing situation, all participants decide to really buy the wines.*

Analyzing the choice of a wine in the laboratory is a two-step process (Haines, Guilkey and Popkin, 1998; Bazoche et al. 2009), allowing to identify differences in consumers' decisions, unlike market data in which the distinction between preference and price related decisions cannot be made. Indeed, a participant refusing to buy a wine, whatever the price, clearly reveals he/she doesn't like it. Table 2 present percentages of consumers not submitting bids for the 4 wines in each situation. Wines are identified by A, B, C, D, as stated before, and situations by 1 (blind tasting), 2 (tasting and label examination), 3 (tasting, label and additional information). Among the 3 consumers not willing to buy in situation 1, there is only one woman, and only one consumer coached by a non-expert. These results show that there is no significant difference between refusals to purchase the wines, but, compared to blind tasting, label examination and additional information have a positive impact on the probability to buy the wines.

wine→ situation↓	A	B	C	D
1	12.5%	8.33%	8.33%	8.33%
2	0	0	0	0
3	0	0	0	0

Table 2: Proportion of consumers not willing to buy

R₂: While high significant correlation rates are observed among all prices in the blind tasting situation, they only survive in subsequent situations between A and D wines.

This result is declined in several observations (see Appendix). First, among prices of the same wine through situation 1 to 3, correlations are high (more than 0.6). This reveals coherent overall consumers choices. Second, in the blind tasting situation, except for one data, all wine prices are significantly correlated, but this is due to significantly higher correlations in prices obtained from non-experts-coached consumers, which can be relevant in two ways: non-expert comments might be too similar or not detailed enough about different wines (the accuracy of the advice can be low, Yaniv (1997), or consumers rely less on those advices they consider useless (as the perceived expertise is low, Birnbaum and Stegner, 1979) but anyhow they do not have themselves to ability to clearly distinguish between wines. Third, when labels and additional comment are revealed about the wines (situations 2 and 3), the only significant correlations remain between A and D wines, which have traditional labels, A being highly personalized, while D is highly sober.

R₃: Not being coached by an expert seems to have an impact on the willingness to pay for wines.

We here conjecture, in line with Dewald (2008), Hogart and Einhorn (1992), Birnbaum and Stegner (1979), Yaniv (1997), that differences in prices are more related to deception of not being coached by an expert rather than to the expert speech influence itself. Indeed, consumers were informed they will be randomly facing an expert or a student, and all consumers were located in the same experimentation room, such as, while not communicating, it still was possible for them to see some others in the room do have expert comments. Therefore, they could form beliefs about the credibility of the comments, the expertise of the critic, and the accuracy of the advice they would have. First, as presented in Table 3, overall average buying prices for wines are by 22,4% lower when consumers are coached by a non-expert critic. Second, women seem more deceived with the non-expert critics and therefore are willing to pay less than with expert advice. Third, low differences exist between men's willingness to pay when coached by experts and their willingness to pay when coached by non-experts. Overall, R₃ supports H₂.

	Men	Women	All
Expert coaching	6.6	8.36	7.68
Non-Expert coaching	7.02	5.52	6.27

Table 3: Average overall, prices, and for men and women, coached by experts or non-experts

R₄: Labels and additional information only increase prices for wines A and D, A benefiting from the higher increase.

Table 4 reports, for the expert-coached group, average prices for each wine in all 3 situations, together with percentages of increases or decreases between situations. Same information, but for non-expert-coached group, are reported in Table 5.

	Situation 1	Situation 2	Situation 3	% of variation S1/S2	% of variation S2/S3	% of variation S1/S3
A	5.31	6.6	7.09	+24.29%	+7.42%	+33.52%
B	8	6.38	6.38	-20.25%	=	-20.25%
C	8.23	7.9	7.26	-4.01%	-8.82%	-11.79%
D	8.62	10.13	10.3	+17.52%	+1.68%	+19.49%

Table 4. Variations in prices between situations

	Situation 1	Situation 2	Situation 3	% of variation S1/S2	% of variation S2/S3	% of variation S1/S3
A	4.35	4.79	4.47	+10.11%	-6.68%	+2.76%
B	6.78	6.08	6.69	-10.32%	+10.33%	-1.33%
C	6.48	6.47	6.78	-0.15%	+4.79%	+4.63%
D	7.04	7.72	7.63	+9.66%	-1.17%	+8.38%

Table 4. Variations in prices between situations

Wine A, the high personalized wine, benefits from the highest increase in the expert-coached group, which fully confirms H₁. This is not fully confirmed within the non-expert coached group, in which tradition label (A and D) has a positive impact on the willingness to pay, but results are strictly reversed for the personalization of the message (willingness to pay increases with discovery and environmental messages, wines B and C). Absolute variations are significantly higher for the expert-coached group.

5. Discussion and conclusion

Based on real sales in three different information conditions, this study brings some results on consumers' willingness to pay for the type of brand personalization, according to their sensory and label characteristics. Results show that sensory characteristics and label information influence consumers' willingness to pay. They also show that consumers value more personalized brands when coached by experts, therefore, vineyards should think about label personalization strategies when supported by personal aura.

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Appendix

1. Information about the wines

  <p style="text-align: center;">A</p>	<p>Élevé dans mon Parc, j'ai deux siècles d'histoire, ce qui se reflète en ce moment de vin et de fleur de vin. Mais dans le même état d'esprit que mon ancêtre... j'ai été élu meilleur vin de France. Cette qualité, faite de techniques et de traditions, que les vigneronnes et les vignerons ont soignées à travers les siècles, est toujours là. Elle est au cœur de la mission de la maison de la vigne et de la vinification. Retrouvez dans mon vin la saveur et le charme qui ont fait le grand vin et la renommée de notre région depuis plus de mille ans, telle est mon ambition, tel est le travail que je m'impose.</p>	  <p style="text-align: center;">B</p>	<p>Depuis 5 générations, le domaine vous propose une dizaine d'appellations.</p> <p>Défenseur des vins de Bourgogne de qualité, nous travaillons notre vignoble dans un but de protection de l'environnement.</p>
  <p style="text-align: center;">C</p>	<p>Cette collection "Terres Inconnues" est issue d'une sélection sévère au sein de notre parcelle. Après des soins minutieux tout au long de l'élevage naît cette cuvée Prestige digne des Grands Vins de Bourgogne.</p>	  <p style="text-align: center;">D</p>	<p>Exploité depuis plusieurs générations, le Domaine se situe sur des terroirs qui comptent parmi les plus prestigieux. Le fruit parle pieusement, avec pureté et équilibre. La vinification est effectuée de façon traditionnelle.</p>

2. Correlations table

	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
A1	1	0,624	0,536	0,649	0,756	0,480	0,299	0,561	0,609	0,441	0,181	0,509
B1	0,624	1	0,491	0,379	0,279	0,761	0,396	0,348	0,224	0,775	0,378	0,356
C1	0,536	0,491	1	0,508	0,233	0,512	0,655	0,440	0,303	0,340	0,618	0,449
D1	0,649	0,379	0,508	1	0,583	0,482	0,570	0,703	0,557	0,374	0,412	0,665
A2	0,756	0,279	0,233	0,583	1	0,387	0,103	0,731	0,854	0,243	-0,024	0,631
B2	0,480	0,761	0,512	0,482	0,387	1	0,415	0,529	0,350	0,830	0,463	0,547
C2	0,299	0,396	0,655	0,570	0,103	0,415	1	0,321	0,118	0,535	0,936	0,328
D2	0,561	0,348	0,440	0,703	0,731	0,529	0,321	1	0,846	0,256	0,180	0,975
A3	0,609	0,224	0,303	0,557	0,854	0,350	0,118	0,846	1	0,163	0,036	0,804
B3	0,441	0,775	0,340	0,374	0,243	0,830	0,535	0,256	0,163	1	0,589	0,262
C3	0,181	0,378	0,618	0,412	-0,024	0,463	0,936	0,180	0,036	0,589	1	0,220
D3	0,509	0,356	0,449	0,665	0,631	0,547	0,328	0,975	0,804	0,262	0,220	1

Bold values are significant at 0.05