Journal International des Sciences de la Vigne et du Vin, 1994, **28**, N°2, 173-179

ANALYTIC CHARACTERISTICS OF RED WINE FROM THE CANARY ISLANDS (SPAIN)

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INTRODUCTION

The Tacoronte-Acentejo region is on the northern slope of the island of Tenerife and has a basically Mediterranean climate, tempered by the mild, damp trade winds. The soil is volcanic, very rich in minerals and highly fertile.

The main varieties are Listan Negro, which enriches the primary bouquet of the wine, Negramoll which produces dry, smooth, rounded wines and Listan Blanco which goes well with the others. To a lesser extent other varieties such as Malvasia, Gual, Tintillo and the socalled Forasteras (foreign) are also cultivated.

Vineyards are found at altitudes ranging from 200 to 800 m above sea-level. The wine is cultivated almost entirely on unirrigated land, on terraced land, or on slightly sloping hillsides which have been sketchily levelled.

Wine production is basically unscientific although studies have been conducted on the isolation, relative abundance and fermentation capacity of natural flora in the local musts (DEBLAS et *al.*, 1981). Most wineries prefer a spontaneous fermentation due to natural yeasts (of which more than 13 species have been indentified). Varietal confusion and altitude induced climatic diversity explain the analytic and organoleptic differences in the wine produced. Red wines have the best reputation and belong in their entirety to the class of young reds.

The wine was produced in small wineries and co-operatives where the owner or partners are also the wine-growers. A long tradition of wine consumption means that quality is the only factor in determining the selection of the raw material and manufacturing process and accounts for the need for typification of the wines with this appellation of origin.

1 - VINEYARD

Site .....

Age of stock in years

Traditional.....

Espalier.....

2- GRAPES

Type	Proportion
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

Health at time of harvesting.....

3- MUST

Parameters

pH .....

Probable alcoholic strength (% vol).....

Total acidity (g/l) .....

Corrections

Tartaric acid (g/l) .....

Other.....

4- VINIFICATION

Date of harvest.....

Maceration

Time.....

Number of times drawn off and pumped back .....

Fermentation

Temperature.....

Control method .....

Density when racked .....

Degree of pressing.....

Corrections

Tartaric acid (g/l) .....

Other.....

Decanting

Number.....

Dates .....

Products .....

Clarification

Number.....

Dates .....

Products .....

Filtering

Number.....

Dates .....

Products .....

Conservation in inert atmosphere .....

Cooperage

Stainless steel

Number .....

Capacity .....

Wood

Type .....

Capacity.....

Time of use.....

Problems .....

Fig. 1 — Winemaking questionnaire

MATERIALS AND METHODS

I — MATERIAL

Seventy-one red wines of the same vintage (90) from twenty different private wineries in the Tacoronte-Acentejo region were analysed.

II — WINEMAKING QUESTIONNAIRE

The following questionnaires were completed (figure 1) :

1°) Vineyard questionnaire : including site of the vineyard, stock varieties and type of cultivation (traditional or espalier). One characteristic to bear in mind is the high temperature and level of exposure to the sun which the fruit is subjected to while maturing and which would contribute according to MARECA (1983) to a greater breakdown of the acid content.

2°) Production questionnaire : giving the methods and conditions of manufacture used to produce the wine. Particular notice was paid to fermentation temperature, maceration time and number of times the must is drawn off and pumped back in order to lower the tannin content as Listan Negro is very rich in tannins; the consequence of this procedure is low colour intensity (PEYNAUD, 1976) and a high content of superior alcohols (DUPLESSIS, 1983).

II — ANALYTICAL METHODS

The analyses were carried out in 1991 when the wines were on average 4 months old. The determination of the pH, density, volatile acidity, total acidity, colouring intensity, tonality, free and total sulphurous anhydride, reducing sugars, total dry extract and alcoholic strength were measured by the official Spanish methods (METODOS OFICIALES DE ANALISIS, 1986).

Superior alcohols and methanol were determined by gas chromatography by direct injection of the wine into a column of Chromosorb 101, 60/80 mesh, 2 m long, and 1/8" in diameter; 2,3-butanodiol was also determined by gas-liquid chromatography by direct injection of the wine into a column of Carbowax 20 M at 10 p. cent in Chromosorb, 60/80 mesh, 4 m long and 1/8" diameter. In all cases a chromatograph with a flame ionization detector was used.

To analyse glycerine, malic, lactic, citric and succinic acids, the Boehringer-Mannheim test combination was used. Tartaric acid was determined by the modified REBELEIN method (VIDAL et BLOUIN, 1978). Anthocyans were obtained by the bisulphite discolouration technique perfected by RIBÉREAU-GAYON et STONESTREET (1965). The total polyphenol index was analysed by the SINGLETON et ROSS method (1965). Tannins were determined by the technique described by MASQUELIER et *al.* (1959) and the method used by AMERINE (1970) was applied to the iron content analysis.

TABLE I

Analytical Results for the Tacoronte-Acentejo Vintage

Parameter	Units	Maximum	Minimum	Mean	Typical Deviation	V.C. (%)
pH		3.94	3.10	3.50	0.19	5.43
Total acidity	g/l*	6.30	3.53	4.84	0.59	12.19
Tartaric acid	g/l	2.25	0.89	1.53	0.34	22.02
Citric acid	g/l	0.48	0.01	0.11	0.10	90.18
Succinic acid	g/l	1.51	0.21	0.74	0.28	38.22
Malic acid	g/l	1.34	0.01	0.15	0.28	182.90
Lactic acid	g/l	2.24	0.09	0.92	0.51	56.07
Volatile acidity	g/l**	1.05	0.27	0.58	0.13	22.41
Tonality index	teinte	1.55	1.47	1.52	0.54	35.53
Colouring intensity		6.17	1.81	3.81	0.91	23.90
Tannins	g/l	3.54	1.74	2.55	0.43	16.86
Polyphenol index		50	24	36	6.16	16.82
Anthocyans	mg/l	307	65	154	42.44	27.44
Propanol	mg/l	66	17	41	32.22	77.25
Methylpropanol	mg/l	143	53	78	18.81	24.02
1-Butanol	mg/l	17	1	3	2.26	73.86
Isoamyl alcohol	mg/l	437	168	291	64.20	22.04
Superior alcohol	mg/l	625	272	414	74.50	17.99
Methanol	mg/l	243	74	133	27.00	20.30
Glycerol	g/l	14.72	5.00	9.16	3.48	37.99
Butanediol	g/l	2.98	0.37	0.75	0.40	53.33
Alcohol content	% vol	14.00	12.00	13.27	0.57	4.30
Dry extract	g/l	33.90	25.30	29.50	2.00	6.78
Volumetric density	g/l	995	992	994	1	0.10
Reducing sugars	g/l	3.42	1.60	1.92	0.30	15.63
Iron	mg/l	11	1	5	2.05	37.27
Free SO_2	mg/l	43	5	19	6.86	34.47
Total SO_2	mg/l	138	15	63	27.38	43.17

* Total acidity in g tartaric acid/l ; ** Volatile acidity in g acetic acid/l

RESULTS

I — QUESTIONNAIRE DATA

The following information was obtained from the questionnaires :

1°) 86 p. cent of the wine is composed of the three, or two of the three, commonest varieties in the region, namely, Listan Negro, Listan Blanco and Negramoll. The remaining 14 p. cent contained a small proportion of other minor varieties of the district such as Negramoll Rosada, Vijariego, Malvasia, Ruby Cabernet etc.

2°) Tartaric acid had to be added to the must in 85 p. cent of the wines analysed in this study and 61% contained one or more grams of tartaric acid per litre.

3°) Almost all the samples had been macerated for 72 hours; 89 p. cent had been shaken two or three times a day while 11 p. cent resorted to drawing off the must and pumping it back to obtain colour. Fermentation took place in the 24-28°C temperature interval.

4°) The wine was generally decanted two or three times. 75 p. cent of the wines were clarified and the only fining agent used was eggwhite.

II — ANALYTICAL RESULTS

Alcoholic strength was about 13.27 p. cent which is a good figure for a region such as the Canary Islands where the climatic conditions advance maturation causing a great deal of sugar to be present in the must which means that there is a high proportion of dry extract as can be seen from Table I.

Total acidity and acid totals are at the lower end of the normal scale as the influence of Listan Negro (which is not rich in acids) is very marked in this area and, taken in conjunction with the high levels of exposure to sun in the island and the scarcity of water in the soil, reduces the level of tartaric acid (MARECA, 1983). This explains the almost universal practice of adding this acid to achieve acceptable acidity levels and a consistent quality.

The colouring intensity is low if compared with wines from Ribera de Duero (Spain) traditionally deeply coloured (ESTACION ENOLOGICA CASTILLA Y LEON, 1991). In addition to the low temperatures and maceration times used in fermentation in order to eliminate any astringent or herby taste, and which have a decisive effect on colour (PEYNAUD, 1976), the fact that the wine is made with a large proportion of Listan Blanco (to provide enhanced acidty and bouquet) contributes to the reduction of colouring intensity.

The superior alcohols are present in quantities greatly in excess of those considered usual in the literature and are similar to those found in the wines of California and Austria (AMERINE et OUGH, 1976). This fact must be directly related to the fermentation conditions, particularly temperature, which, being moderately low, favouring the formation of superior alcohols.

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It should be noted that 2-butanol is missing ; although this is not a standard parameter in many wines, it is nonetheless present in some (HABA et *al.*, 1989). The volatile acidity of the wines falls within normal limits, indicating the absence of bacterial alteration, in agreement with adequate sulphiting reflected in the correct levels of free and total sulphurous an hydride.

CONCLUSIONS

The Tacoronte-Acentejo region produces a limited amount of wine. Analysis of the red wine of this region reveals certain technological deficiencies, particularly lack of colour due to the rigorous control of the astringent elements in the fermentation. The low acidity caused by raw material with little intrisinc acidity and by a general tendency on the part of the local wine growers to harvest when the grape is over-ripe is responsible for the large amount of tartaric acid added to the must in almost all the samples.

The quality of these wines could be improved by a) selecting stock on the basis of soil and climate and b) defining the manufacturing and storage processes best adapted to produce balanced wines of constent quality.

Note reçue le 28 décembre 1993

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