STUDY OF TECHNOLOGICAL SCHEMES OF TREATMENT OF BASE WINE AND THEIR INFLUENCE ON FOAMY PROPERTIES OF SPARKLING WINES

STUDIUL SCHEMELOR TEHNOLOGICE DE TRATARE A VINURILOR DE BAZĂ PENTRU SPUMANTE ŞI INFLUENȚA LOR ASUPRA PROPRIETAȚILOR DE SPUMARE

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Abstract. *Technological schemes of treatment of cuvee and blends of base wine considerably influence physico-chemical parameters and foamy properties of the treated wines. Values of foamy properties of researched wines vary depending on the origin and doses of fining material in treatment process.*

Rezumat: *Schemele tehnologice de tratare a asamblajelor şi cupajelor de vinuri de bază pentru spumante exercită o influență semnificativă asupra indicilor fizico-chimici şi proprietaților de spumare a vinurilor tratate. Valorile proprietaților de spumare a vinurilor cercetate se variază în dependență de originea materialelor de cleire şi dozele de administrare în procesul de tratare.*

Keywords: base wine for sparkling wines, fining material, wine treatment, bentonite, fish glue, tannin, gelatine, foamy properties, stability, physico-chemical parameters.

Cuvinte cheie: Vin de bază pentru spumante, materiale de cleire, tratarea vinurilor, bentonită, clei de peşte, tanină, gelatina, proprietați de spumare, stabilitate, indici fizico-chimici.

INTRODUCTION

The quality of sparkling wines in a large measure is due to the content of superficial active substances, that contribute formation of foamy and frothy properties, being characteristic of this kind of special wines (effervescent wines). The superficial active substances content of base wine is highly correlated with the technological schemes of technological treatment and fining material used.

In oenological practice it was determined that physico-chemical parameters and organoleptic appreciation of base wines vary depending on the use of different technological procedures of their physico-chemical stabilisation (Taran, Soldatenco, 1995, Prida, 1999).

The experimental results obtained by Merjanian (1965), Gherjicova (1968) et al. indicate that both wine fining with proteins (casein, fish glue,

gelatine) and technological treatment in combination with the use of tannin and potassium hexacyanoferrate (II) contribute amelioration of foamy properties of wines used in sparkling wines production. Polyphenols are known to be strong stabilizators of wine foam not only as macromolecular compounds, that form elastic absorbtion stratum, but as compounds that form a gel structure in combination with proteins in wine (Valuico, Zincenco, 1987: Ejov, Gherjicova, 1996).

But after wine treatments with substances of mineral origin (bentonite, coloidal solution of SiO_2) the foamy and frothy properties of treated wines become lower comparatively with wine treatment with fish glue and tannin, that can be explained by proteins absorbtion by bentonite (Taran, 1995).

The references study reflects fragmental information concerning the role of technological treatment on physico-chemical parameters and foamy properties of base wine for sparkling wines.

Goal of the study. The aim of this study was to determine the influence of different schemes of treatment, doses of fining material on physico-chemical parameters and foamy properties of base wine for sparkling wines.

MATERIALS AND METHODS

Scientific research had been effectuated in the laboratory „Sparkling Wines and Microbiology" and section „Microwinemaking" at the National Institute for Viticulture and Winemaking (NIVW) during 2006-2008.

In our study we used the blends of wines made from different grape varieties: Chardonnay, Pinot blanc, Pinot gris, Sauvignon, Riesling and Aligote.

Physico-chemical parameters of base wine had been determined according to the methods recommended by OIV and modificated ones at NIVW. Foamy parameters of base wines had been determined instrumental according to the international method, using the special installation „Mossalux" (France). Determination of the wines foamy properties is based on the intrerruption of infra-red light bunch by the foam of studied wine because of injection of the gas carbon dioxide (CO_2) in standart conditions through a filter with calibrated porous fibres. The foamy properties of wines are expressed by the determination of the following parameters:

- maximal height of the foam (MH)
- height of the foam stabilisation(HF)
- time of the foam stabilisation (TF)

RESULTS AND DISCUSSIONS

Determination of foamy properties of wine blends for sparkling wines in different wineries in the Republic of Moldova (wine factory „Cricova" S.A., winery„Vismos" S.A., NIVW şi al.) allows us to find out the major influence of blend composition on this parameter. The use of the base wine from varieties Chardonnay and Pinot group contributes increasing of the foamy properties of studied blends, and vice versa the use of wines from varieties Aligote, Riesling de Rein, Sauvignon leads to decreasing of this parameter of sparkling wines. If for blends of wines made from varieties Chardonnay and Pinot foamy parameters

range in the interval: maximal height of the foam (MH) from 60 up to 110 mm, height of the foam stabilisation(HF) from 46 up to 85 mm, then for blends made from Aligote, Riesling de Rein and Sauvignon, maximal value of MH ranges up to 56 mm and HF only 45 mm.

In order to find out the influence of different technological schemes of treatment of base wines on foamy properties we have studied fining material: bentonites from Italy, France, Georgia, tannin, fish glue, gelatine used at different doses and combinations.

The blends of wines after treatment with different materials and at different doses have been subjected to physico-chemial analysise, inclusively and analysise of foamy properties.

Obtained results show a major influence of treatment schemes depending on the doses of bentonite solution on physico-chemical parameters or degree of clarification of base wine for sparkling wines.

The table shows the influence of technological treatment on foamy properties of base wines.

Table1

The influence of different technological treatment schemes on foamy parameters of base wine for sparkling wines.

№	Substance name	Dose, g/dm^3	Maximal height of the foam MH, (mm)	Height of the foam stabilisation HF, (mm)	Time of the foam stabilisation TF, (sec)
Control (initial wine)		-	56	45	
1	Bentonite (Italy)	0,3	54	43	234
2		0,5	49	38	147
3		1,0	34	28	136
4		1,5	32	27	123
5	Bentonite (France)	0,3	33	29	152
6		0,5	23	20	131
7		1,0	18	15	55
8		1,5	8	7	39
9	Bentonite (Georgia)	0,3	28	17	152
10		0,5	23	15	143
11		1,0	16	10	124
12		1,5	8	7	43
13	Tannin and fish glue	0,1/0,1	56	41	246
14		0,1/0,2	49	38	138
15		0,2/0,2	12	11	105
16	Bentonite and gelatine	0,05/0,5	21	16	165
17		0,1/0,5	19	14	143
18		0,1/1,0	10	8	106

It was found out that among the bentonites used for wine treatment, bentonite from Georgia and France has the hardest influence on foamy parameters, its foamy parameters (HF and MH) have decreased at 3-7 times, but for bentonite from Italy - at 1,7-1,8 times (doses 1-1,5 g/dm^3).

Also the treatment of wine blend after the schemes: bentonite+gelatine has been appreciated negatively with obtaining of decreased foamy properties and can not be recommanded for implimentatin in winemaking practice in the sparkling wines production process.

CONCLUSIONS

The composition of the blends of base wines plays a main role in formation of their qualitative foamy properties. Wine blends, that contain base wine from varieties Chardonnay and Pinot group are characterized by high parameters of the foam formation and rate of the foam stabilisation.

Technological schemes of treatment of cuvee and blends of base wines considerably influence physico-chemical parameters and foamy properties of the treated wines.

This study allows us to establish, that bentonite from Georgia and France has the hardest influence on foamy parameters, its foamy parameters (HF, MH and TF) have decreased at 3-7 times, but for bentonite from Italy these parameters decreased only at 1,7-1,8 times. With increasing of the bentonite dose (from 0,3 up to 1,5 g/dm^3) more considerable decreasing of foamy properties of the blends of base wines is observed.

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