ABSTRACT

THE STUDY OF NATURAL AND TECHNOLOGICAL CONDITIONS THAT DEFINE THE VITICULTURE AND WINEMAKING POTENTIAL OF DRAGASANI VINEYARD

Keywords: *vineyard, winemaking center, variety, assortment, grapes, quality potential, yields, wine, composition, trends wine production*

The purpose of the study was aimed at sizing, on a scientific-objective, the degree of favorability for viticulture of Drăgăşani – Vâlcea vineyard, as a whole, and to establish the real oenological potential of the assortments for white, semiaromatic, aromatic and red wines varieties planted in three of the most representative winemaking centers.

With the demands on the quality that is required from Romanian wines, under the conditions established on the competition market, and especially on the global wine market, such a study was required by necessity.

The researches were done during the wine years 2006, 2007, 2008 and 2009, being considered: Olt Hill center, Greaca-Eforie-Dobruşa center, Mamului and Beicăi Hills center, all three in succession on the north-south direction, covering an area over a length of 40 - 45 km, between Orleşti Cârlogani - Vâlcea County and Schitu - Olt county.

The three winemaking centers have well contoured oenological coordinated, conferred by the great river Olt, several streams that flow generally North-West – South-East into the Olt river, massive forest, different soil types, topographical, exposures, etc.

Varieties from the three centers, taken in the study were: Italian Riesling, Fetească albă and Fetească Regală and Crâmpoşie - for white wines, Sauvignon, Muscat Ottonel, Tămâioasă românească - for semiaromatic and aromatic wines, Cabernet Sauvignon, Merlot, Fetească Neagră , Novac, Negru de Drăgăşani, Pinot Noir - for red wines.

In order to achieve the intended purpose the following objectives were targeted:

- ✓ OBJECTIVE 1: "Establish the potential of quality,of productivity and of yield for the assortment varieties composition of each winemaking center, at technological maturity "
- ✓ OBJECTIVE 2: "Specify the technological potential of each variety depending to the viticultural years and the production centers "
- ✓ OBJECTIVE 3: "Define the composition and quality of wines obtained by rigorously controlled and uniform technologies, for the same categories in the three grapevine centers "
- ✓ OBJECTIVE 4: "Hierarchy of varieties and production wines directions from Drăgăşani vineyard according to the productivity and efficiency parameters of the grapes and the compositional ones of the wines.”

MAIN RESULTS OBTAINED

➢ **REGARDING THE QUALITY POTENTIAL OF THE GRAPES RELATED TO AREA AND CLIMATIC CONDITIONS**

In the same year and the same production center, the quality characteristics of grapes at technological maturity, esatblished at calendaristic dates very close for the same winemaking direction, are different related to the varieties from the assortments.

For the same variety grown in the same production center, major developments in quality parameters of the grapes are decisively influenced by climatic conditions specific to each year:

- in years with early spring and hot summers with more poor rainfall and abundant sunshine, the phenophases of grapes maturation were reached earlier, but at higher contents in carbohydrates, anthocyanins and polyphenols compared to the same items in the cooler and rainy years.

- in years with wetter and cooler last month of summer and early autumn month, at the same dates fixed for technological maturity, the grapes are poor in carbohydrates, anthocyanins and flavor, but with higher acid content;

- In years with a good supply of water in the soil, and with higher thermic, hidric and insolation balances, the technological maturity is achieved at dates that not exceed September, but at very convenient content of carbohydrates, acidity, anthocyanins and flavors.

In the general assortments of each production center, the varieties belonging to the three winemaking directions, keep the same hierarchy, concerning the levels of major constituents of grapes regardless of the climatic conditions of the years.

In similar climatic conditions to those of the experimental years all varieties of the assortments from the three winemaking directions, except Crâmpoşia Selecționată, are able to produce high-quality wines with appellation of origin, by choosing the most appropriate time of harvest, having in mind to avoid unnecessary losses of yields.

Although between years existed significant differences for climatic factors, among the basic constituents of the same variety of grapes grown in the same production center differences did not record significant values, which highlights the security of a real constant in time and space of the products obtained from each variety.

The quality potential of grapes (represented by the carbohydrate, acidity, anthocyanins and flavor contents) is clearly reflected in the wines composition.

- **REGARDING THE PRODUCTIVITY PARAMETERS OF VARIETIES**

In the same area, the same year under the same winemaking techniques, grape yields are also attributes of their genetic nature.

For the same variety grown in the same area, grape yields are influenced by climatic conditions of the years . They are higher in years with better soil water supply in relation to increased sunburn and heat balances. For the same year and in equal conditions of winemaking techniques, the yields of the same variety grown in the three centers are not significantly different.

In all the years considered and wine-making centers, the largest yieds were recorded at the Romanian varieties Negru de Drăgăşani and Novac (10156 kg/ha

and respectively 10094 kg/ha), followed by Crâmpoşie selecționată varieties (almost 10 t/ha) and Tămâioasă românească (9220 kg/ha). Yields over 8.5 t/ha are obtained from varieties: Fetească regală, Merlot and Fetească neagră, followed with a small difference by Italian Riesling (with 8326 kg/ha).

The yields between 7.0 and 7.5 t/ha were recorded at Cabernet Sauvignon, Muscat Ottonel and Fetească albă, but the yields from Pinot Noir are a little bit under 7000 kg/ha (6983 kg/ha).

- **REGARDING THE COMPOSITION AND THE QUALITY OF WINES**

The composition and the quality of wines produced in the great territory of Drăgăşani vineyard, are characterized in relation to the rules laid down by viticulture and winemaking laws, for the main features namely: at least 10,5% vol alcohol for quality wines and minimum 11,0% vol for high quality wines with appellation of origin; the minimum acidity 3,5 g/l (as H_2SO_4); the unreduced extract at least 19,0 g/l in white wines and minimum 23,0 g/l in red wines .

In the conditions of the four years and of all three centers:

- The white wines of Italian Riesling, Fetească albă and Fetească regală, in their entirety, in any case haven't been recorded alcoholic degrees below 12.0% vol and have never reached 13,0% vol, with acid contents between 3,95 g/l and 4,50 g/l (as H_2SO_4) and with unreduced extract contents between 19,28 g/l and 20,5 g/l.

- Crâmpoşie selecționată white wines were presented: the alcoholic degree between 8,7% vol and 11,5% vol; acidity contents depending on the year, not below 3,38 g/l, but no higher than 4,02 g/l (as H_2SO_4), with content in extract variable between 15,8 g/l and 17,0 g/l.

- Semiaromate wines of Sauvignon and the typical aromatic wines of Muscat Ottonel and Tămâioasă românească recorded exceptional alcoholic degrees, ranging from 12,8 %vol. and 13,4 %vol. for Sauvignon, exceeding constantly 13,0 %vol. at Muscat Ottonel and located between 12,6 %vol. and 13,02 %vol. at Tămâioasă românească.

- For Sauvignon wines and Tămâioasă românească, total acidity did not decrease in any case under 3,8 g/l, but reached levels above 4,0 g/l (as H_2SO_4) several times. Muscat Ottonel wines acidity is deficient, often below 3,0 g/l and not above 3,20 g/l (as H_2SO_4).

- Semiaromate and aromate wines, produced with pelicular maceration or classic, recorded unreduced extracts contents with the lower limit of 22,0 g/l and the upper limit of 23,6 g/l, higher contents being recorded at Tămâioasă românească wines. Terpenic aromatic profiles correspond, in all cases, to the most exigent demands.

The quality, the compositional balance and the naturalness of semiaromate and aromatic wines of the vineyard come out from the proportions of glycerol comparatively to alcohol and ash to unreduced extract, being between 9,14% and 9,86% and between 9,48 % and 9,93%.

Red wines obtained from grapes of the 6 varieties grown in the vineyard, throughout time and space, highlights the exceptional physical and chemical compositions, corresponding to the highest category of quality:

- alcohol contents between 12.0% vol and 13.3% vol, in most cases of over 12.5% vol

- the total acidity contents with limits of variability between 3.17 g/l and 3,40 g/l in Pinot Noir wines (which is also recorded with the highest alcohol content) and between 4.0 g/l and 4.8 g/l (as H_2SO_4) for the other varieties wines.

- unreduced extract with lower limit of 25,38 g/l (Negru de Drăgăşani) and the upper limit of 28,16 g/l (Pinot Noir)

- glycerol contents between 9,20 g/l and 10,5 g/l joining the other compositional parameters;

- glycerol proportions compared to alcohol and the ash compared to unreduced extract, being between 9,55% and 10,30% and between 4,45% and 10,11%, "confirms" the high degree of quality and naturalness of Drăgăşani red wines.

The high value, concerning the oenological and safety-food aspect, of red wine is also given by the anthocyanines contents from their composition:

- exceptional contents in Cabernet Sauvignon, Novac and Negru de Drăgăşani wines, ranging from 700 mg/l to 811 mg/l,

- good and very good contents in Merlot and Fetească neagră wines, ranging from 600 mg/l to 700 mg/l,

- less contents, but sufficient, in Pinot Noir wines, ranging from 360 mg/l to 400 mg/l.

The quality of anthocyanins in red wines, with influence of visual order, is given by the proportions of the three classes of pigments found in the levels of color tonality and the chromatic indicator of synthesis - flavilium cations (dA%) recorded, at all varieties, years and production centers, between 0,453 (Cabernet Sauvignon) and 0,630 (Pinot Noir) and between 60,20% (Pinot Noir) and 68,30% (Cabernet Sauvignon).

- **REGARDING THE VARIETIS HIERARCHY AND THE PRODUCTION DIRECTIONS, OVER THE VINEYARD**

Based on a default points system, for the main oenological characteristics of the 13 varieties grown in the vineyard have revealed the following:

- In section grapes quality at harvest, Cabernet Sauvignon was on the first place, followed by Negru de Drăgăşani, Novac, Merlot and Tămâioasă românească. The report total score / variety highlights the direction of red wines followed by the direction of semiaromate and aromatic wines.

- In the productivity and output parameters section, on the first place in the hierarchy general assortment, is the variety Negru de Drăgăşani , followed by Novac and Tămâioasă românească. The last three places are occupied by Pinot Noir, Sauvignon and Cabernet Sauvignon. The report total score / variety positions in the top also the direction of red wines, followed by white wines direction.

- In composition and wine quality section, in the general assortment, on the first place is Pinot Noir, followed by Cabernet Sauvignon and Merlot, the last place being occupied by Crâmpoşia Selecționată. The report total score / variety by category of wine is clearly in favor of quality red wines (with 68,3 points to 50,3 points for aromatic wine category and 25,0 points for white wines).

Taking into consideration the partial scores regarding the technological elements, total scores on the variety and types of wines and the reports - general scores / variety of wine category, it certainly comes out, that in Drăgăşani Vineyard the direction of quality red wine production has priority, followed by the direction of semiaromate and aromatic wines.

Regarding the direction of aromatic wine, the native variety Tămâioasă românească confirms again the high potential and good quality and productive capacity as convenient.