THESIS SUMMARY
"THE STUDY OF NATURAL AND TECHNOLOGICAL FACTORS WHICH DETERMINE THE DEGREE OF FAVORABILITY FOR VITICULTURE OF THE OLTETUL INFERIOR HILLS AND MOUNDS"

Keywords: area, climate, soil, variety, assortment, potential, grape, wine, chemical composition

The researches have been performed during the period of viticultural years 2008, 2009, 2010, the investigations being the first steps on obtaining accurate information, on the ecological components in connection with the requests of the vine. The following issues were taken into account: geographic features, orography, altitude, climate, soils, environs.

The researched varieties of the old plantations, still existing on the hills along the Olteţ, between Jianu Iancu and Sarului Forest, but also from other locations in the east, with similar environmental conditions were: Crâmpoşia selecţionată, Italian Riesling, Fetească albă, Pinot gris – for "neutral" white wine; Fetească regală, Sauvignon, Muscat Ottonel, Tămâioasă românească – for semi-flavored and flavored wines, Cabernet Sauvignon, Merlot, Pinot noir, Fetească neagră, Novac, Negru de Drăgăşani – for high quality red wines.

From oenological point of view, to achieve the aim the following objectives were targeted:

Objective 1: Defining the quality and productivity potential of the varieties, at different phenophase maturation of grapes.

Objective 2: Indicating the compositional and quality oenological capacities of the wines obtained through out biotechnological means similar for the same direction of production.

Objective 3: Ranking varieties and directions of production in the area, based on: quality potential of the grapes, yield and rating parameters, composition and quality of the wine.

OBTAINED RESULTS

At complete ripeness, on assortments and experimental period:

The carbohydrates, as average levels were situated: between 147 g/l at Crâmpoşie selecţionată and 202 g/l at the assortment of Pinot Gris for white wines; between 191 g/l at Fetească regală and 204 g/l at Muscat Ottonel for varieties of semi-flavored and flavored white wines, between 194,3 g/l - at Merlot and 204 g/l at the varieties Pinot noir for superior high quality red wines.

The acidity of the grapes has presented for all varieties, the lowest contents in the very warm year 2008. The average contents were between: 4,41 g/l at Pinot gris and 5,46 g/l at Italian Riesling in the case of “neutral” white wines assortment; between 3,14 g/l - at Muscat Ottonel and 5,12 g/l at Fetească regală in the case of semi-flavored and flavored varieties; between 4,21 g/l - at Pinot noir and 5,44 g/ l - at Cabernet Sauvignon for red wines varieties.

The total polyphenols, during the experimental period, recorded contents that were situated between 1,65 g/kg beans (Pinot gris) and 1,88 g/kg beans (Fetească albă) at “neutral” varieties for white wines; between 1,77 g/kg beans (Fetească regală) and 1,83 g/kg beans (Sauvignon) at varieties for semi-flavored and flavored wines; between 3,57 g/kg beans (Pinot noir) and 4,22 g / kg beans (Negru de Drăgăşani) at the assortment for high quality red wines.

The aromatic potential in semi-flavored and flavored varieties of grapes, recorded higher levels in condition of warm and sunny years. The averages of flavored total contents are situating in front of assortment Tămâioasă variety (with 11 312 mg/kg grain), followed by Muscat Ottonel (with 9453 mg/kg beans) and Sauvignon (with 1370 mg/kg beans). For total terpenic potential, the free flavors (TVL) occupy: 77,6% - at Sauvignon, 42,4% at Muscat Ottonel, 44,2% at Tămâioasă românească.

The linked in precursors flavors represents: 22,4 % at Sauvignon; 57,6 % at Muscat Ottonel; 55,8 % at Tămâioasă românească.

The anthocyanic potential of black grapes, at complete ripeness brings in the first place the Cabernet Sauvignon variety (with 1410 mg/kg beans) followed by Novac and Negru de Drăgăşani (with 1367, respectively 1368 mg / kg beans). Fetească neagră and Merlot varieties recorded anthocyanic contents with just over 1280 mg/kg beans and Pinot noir with 595 mg/kg beans occupies the last position.

- At phenolic ripeness the six varieties grapes had presented increased anthocyanic contents: reaching the level of 1480 mg/kg at Cabernet Sauvignon, slightly exceeding 1400 mg/kg at Novac and Negru de Drăgăşani, with levels of 1320 respectively 1332 mg / kg beans at Merlot and Fetească neagră and very close to 640 mg / kg beans at Pinot noir.

- At technological ripeness, reached especially in the last decade of September, the anthocyanic contents were lower than at phenolic maturity, but more than those recorded at complete maturity, ranging between 623 mg/kg beans (at Pinot noir) and 1453 mg/kg beans (at Cabernet Sauvignon).

The anthocyans extractibility increased from complete ripeness to technological maturity, being situated: between 46,9% (Cabernet Sauvignon) and 52,7% (Pinot noir) at complete ripeness; between 48,7% (Cabernet Sauvignon) and 55,3 % (Pinot noir) at phenolic maturity; between 51,0% (Cabernet Sauvignon) and 57,2% (Pinot noir) at technological maturity.

At technological maturity, although the anthocyanic contents were lower than the ones corresponding to phenolic maturity, technological reserves were higher because of extractability's increases. With the biggest technological reserve have been registered the varieties: Cabernet Sauvignon (741,3 mg/kg beans), Negru de Drăgăşani (730,7 mg/kg beans), Novac (732 mg/kg beans). Pinot noir variety presented the lowest technological reserve of anthocyans, although at extractability was in the first place.

Regarding the chromatic structures of anthocyanic complexes of grapes, between the phenolic and technological ripeness occurred increases of red and blue pigments proportions and decreases of the yellow component, for all varieties. Without Pinot Noir at which the red component situated less under 60% (59,3%), to all the other varieties the red pigments have registered averages between 60,6% at Negru de Drăgăşani and 61,4% at Cabernet Sauvignon .

The increases evolutions of the red and blue components of the anthocyanic extracts obtained from comparable samples of grapes have determined during ripeness phenophases, evolution in the same sense of the coloring intensity and flavilium cations and continuous decrease of the yellow component, in a measure more important than increase of the red component, has attracted a continuous decrease in all varieties of the color tonality.

In the same area, the contents of total polyphenols and tannins from the grapes, on different phenophases of ripeness, depending on the nature of varieties. At

complete ripeness, the total polyphenol contents were situated between 1,65 g/kg beans and 1,88 g/kg beans for white wines varieties; between 1,93 g/kg beans and 2,03 g/kg beans for flavored and semi-flavored wines varieties; between 3,57 g / kg beans and 4,22 g / kg beans for red wines varieties.

Between complete and technological ripeness, both total polyphenols and tannins have known decreases. At total polyphenols the decreases were: between 8,6% and 12,1% for white wine varieties; between 7,6 to 10,4% for semi-flavored and flavored varieties; between 7,6% to 17,4% at high quality red wines varieties.

At technological ripeness of the grapes, the relative contents in carbohydrates from beans, are corresponding, except Crâmpoşia selecţionată to obtaining white wines, flavored and red high quality. The average contents are eloquent: between 211 g/l (Italian Riesling) and 226 g/l (Pinot gris) at white wine assortment; between 213 g/l (Fetească regală) and 228 g/l (Muscat Ottonel) at semi-flavored and flavored wines assortment; between 212 g/l (Negru de Drăgăşani) and 231 g/l (Pinot noir) at red wines assortment.

At grapes harvesting moments, the acidity, generally low at Muscat Ottonel and with the little deficit in warm years at Pinot gris and Sauvignon, in all other cases recorded contents in total accordance to the establish rules for high quality wines.

In semi-flavored and flavored assortments of grapes, the superior contents in terpenic compounds present the warranty of obtaining typical wines, with aromatic profile perfectly outline, thermal balance but mostly high sunstroke are the base of accumulation in black grapes of important anthocyans quantities, besides Cabernet Sauvignon also Romanian assortments Fetească neagră, Novac şi Negru de Drăgăşani.

The parameters of productivity and efficiency are the basic attributes of the specific genetic nature of varieties.

- At technological ripeness, the yields were situated on top of assortment for white wines variety Crâmpoşie selecţionată with 10363 kg/ha, followed by in descending order: Italian Riesling (8248 kg/ha); Fetească albă (7353 kg/ha), Pinot gris (6430 kg/ha), in all cases as the average values of yields.

- At the assortment for flavored and semi-flavored wines, the yields of grape bring on the first place Tămâioasă românească variety (9187 kg/ha), followed by Feteasca regală (8250 kg/ha), Sauvignon (7198 kg/ha), Muscat Ottonel (6982 kg/ha).

- At the assortment for high quality red wines with the biggest yields were situated Negru de Drăgăşani and Novac varieties (with 9677 kg/ha, respectively 9737

kg/ha). More than good yields were obtained from Merlot and Fetească neagră varieties (8733 kg/ha, respectively 8737 kg/ha). With yields between 6500 kg/ha and 7000 kg/ha were Pinot noir and Cabernet Sauvignon varieties (6553 kg/ha, respectively 6940 kg/ha).

xxx

The wines obtained using uniform biotechnology for all the varieties belonging to the same category have presented differences under compositional and organoleptic aspect, in relation to the nature of raw material and viticultural year.

Regarding “neutral” white wines:

According to relative contents of carbohydrates in musts, at assortment level and experimental period, the degrees in alcohol have presented the lower limit of 10, 50 %vol. – at Crâmpoşie selecţionată (2010), and the superior limit of 12,80 %vol. at Fetească albă (2008). Except Crâmpoşie selecţionată for all the other varieties, the alcoholic degrees have not decreased under 12,0 %vol. in any viticultural years.

The total acidity, for all assortment and viticultural years have been ranking between 3,17 g/l at Pinot gris (2008) and 4,38 g/l – at Italian Riesling (2010). Averages were between 3,39 g/l – at Pinot gris and 4,24 g/l – at Italian Riesling.

The glycerol corresponding to carbohydrates contents after fermentation have presented a variability between 6,78 g/l – at Crâmpoşie selecţionată (2010) and 9,11 g/l – at Pinot gris (2008), recorded averages between 7,03 g/l at Crâmpoşie selecţionată and 9,04 g/l – at Pinot gris.

In relation to alcohol, glycerol represents proportions between 8,20 % - at Crâmpoşie and 9,27 % - at Pinot gris.

The unreducing extract, as average values, situates in front of the assortment Pinot gris wines with 20,45 g/l, the last place being occupied by Crâmpoşie selecţionată with 16,24 g/l. At Italian Riesling and Fetească albă the extractivity had averages of 19,66 g/l, respectively 19,65 g/l.

The ash, from the extract composition has presented no lower average contents of 1,40 g/l – at Crâmpoşie and not higher than 1,94 g/l – at Pinot gris, representing proportions from unreducing extract between 8,62 % - at Crâmpoşie selecţionată and 9,48 % at Pinot gris.

At organoleptic analysis the average notes highlighted Pinot gris variety with 18,92 points, followed by: Fetească albă with 18,75 points; Italian Riesling with 18,70; Crâmpoşie – with 17,0 points.

Regarding semi-flavored and flavored Feteasca regala, Sauvignon, Muscat Ottonel and Tămâioasă Românească wines:

The alcoholic degree has not decreased in any year in any variety and vineyard under 12,10 %vol, achieving averages between 12,22 %vol and 13,23 %vol. It's however worth mentioning that the carbohydrate content of "Muscat Ottonel" and "Tamaioasa Romaneasca" wines has remained unchanged up to 20 g/l, giving them semi-dry or semi-sweet natural character.

Total acidity, generally poor at Muscat Ottonel wines (between 2,86 g/l and 3,30 g/l, with an average of 3,07 g/l) presents normal contents to all the other wines, with a variability between minimum degree of 3,8 g/l (Sauvignon) and maximum 4,80 g/l (Fetească regală), found in averages between 4,04 g/l – at Sauvignon and 4,57 g/l – la Fetească regală.

The glycerol has not decreased in any situation under 8,20 g/l (Fetească regală), but overcame many times the degree of 9,0 g/l, reaching upper limit of 9,85 g/l (Sauvignon 2008)

The averages bring on the first place Sauvignon wines (with 9,58 g/l). For the other varieties the averages were between 8,56 g/l (Fetească regală) and 8,97 g/l (Muscat Ottonel), representing proportions over 9% for all varieties, except Crâmpoşie selecţionată (8,79 %).

The unreducing extract with general variability between 19,96 g/l (Fetească regală) and 23,18 g/l (Tămâioasă românească) found in averages between 20,10 g/l (Fetească regală) and 23,06 g/l (Tămâioasă românească), totally corresponds to the condition required for white wines by maceration.

The ash, with average contents between lower limit of 1,83 g/l (Fetească regală) and upper limit of 2,22 g/l, represent proportions from extract between 9,11 % (Fetească regală) and 9,63 % (Tămâioasă românească).

Total terpenic aromatic substance in typical semi-flavored and flavored wines brought together averages of: 5363 µg/l – for Tămâioasă românească; 5318 µg/l – for Muscat Ottonel; 788,3 µg/l – for Sauvignon. From existing terpenic aromatic contents in the grapes to obtain a liter of wine these levels represent: 33,0 % at Tămâioasă românească; 39,4 % at Muscat Ottonel; 35,6 % at Sauvignon.

Into the total terpenic substance, free flavorings occupies: 74,4 % at Sauvignon wines; 33,8 % at Muscat Ottonel wines; 41,0 % at Tămâioasă românească wines.

At tasting, exceptional results were obtained by Tămâioasă românească and Sauvignon wines (averages of 19,18 and 19,17). In all cases, good results were

recorded also at Fetească regală wines (average of 19,03) and Muscat Ottonel (average 18,87), according to the scoring system for “gold medal” distinction.

Regarding high quality red wines:

Red wines have recorded compositions and sensory attributes in total agreement with the rules established for high quality categories.

Throughout assortment and viticultural years:

The alcohol has not decreased in any situation under 12,05 %vol (Novac – 2010), but also has reached the degree of 13,75 %vol (Pinot noir – 2008), the averages for this parameter were between: 12,42 %vol (Novac) and 13,51 %vol (Pinot noir).

Total acidity, lower in Pinot noir wines (between 3,80 g/l and 3,91 g/l), is still within the limits of wines law. For the other five wine varieties (Cabernet Sauvignon, Merlot, Fetească regală, Novac, Negru de Drăgăşani) acidity was situated between 4,35 g/l and 4,98 g/l, achieving average values between 4,43 g/l (Fetească neagră) and 4,96 g/l (Cabernet Sauvignon).

Glycerol, according to the assortment level and experimental period, with variability between 9,08 g/l (Negru de Drăgăşani) and 10,80 g/l (Pinot noir), is an important quality factor.

The unreducing extract, with limits between 25,72 g/l (Novac) and 27,60 g/l (Pinot noir) and averages of 25,85 g/l (Novac) and 27,19 g/l (Pinot noir), offers to wines an obvious “fullness”, specific to high quality products.

In the composition of unreducing extract, the ash is in average proportions so close to the ideal degree (10%), the lower limit being 9,62% (Negru de Drăgăşani – 2010) and the upper limit being to 10,03% (Pinot noir - 2008). Throughout the assortment, this quality parameter is situated between 9,67% - at Negru de Drăgăşani and 9,96% - at Pinot noir.

A little smaller anthocyans contents at Pinot noir wines (between 372 mg/l and 398 mg/l and an average of 385 mg/l) are totally corresponding in all the other five wine varieties, with limits between 665 mg/l (Merlot - 2009) and 746 mg/l (Cabernet Sauvignon - 2008), averages were between 673 mg/l (Fetească neagră) and 720 mg/l (Cabernet Sauvignon).

Synthetic color indicator represented by flavilium cations shows the highest levels of wines: Cabernet Sauvignon (66,9%); Fetească neagră (65,9%); Novac (65,7%). With the lowest proportion of flavilium cations were registered Pinot noir wines (as average 63,1%).

The total polyphenols and tannin average contents, between 3,03 g/l (Pinot noir) and 3,68 g/l (Cabernet Sauvignon) and between 2,84 g/l (Pinot noir) and 3,35 g/l (Cabernet Sauvignon) are able to give absolute firmness required for this wines category.

At sensory analysis, all wines have obtained good notes, ranging between 18,45 (Novac) and 19,50 (Pinot noir), the averages for all varieties, fullfill the condition for awarding the Gold Medal.

xxx

Under a prearranged and rigurous system for quality parameters of the grapes, the productivity and yield parameters of the varieties and for composition wine parameters were obtained the following results:

Add up scores on three oenological sections situate on the first four places the varieties for high quality red wines: Novac, Negru de Drăgăşani, Merlot şi Fetească neagră, Cabernet Sauvignon.

Overall scores on the assortments, but mostly average score for environment / variety / assortment brings into focus the category of high quality red wines (with overwhelming participation of Romanian varieties Novac, Negru de Drăgăşani, Fetească neagră), followed by the category of semi-flavored and flavored wines and on the last place white wine category.