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The Evolution of wines during their maturation in the viticultural centre of Jidvei – Tarnave vineyard

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Abstract

Tarnave vineyard, the largest one in Transilvania is part of the wine growing region of the Transylvanian Plateau. It is located in the hydrographic basin of the two Tarnava rivers (Tarnava Mare and Tarnava Mica).

The viticultural centre of Jidvei, one of the largest centres of the Tarnava vineyard is situated along the road between two small towns Tarnaveni and Blaj and the natural environment proves to be particularly favourable for viticulture.

The study pursue the evolution of quality white wines with designation of origin of the types DOC – CMD, DOC – CIB of the Feteasca regala, Riesling Italian and Muscat Ottonel varieties in the viticultural centre of Jidvei, Tarnave vineyard, during their maturation.

Determinations and findings were made during the years 2009 – 2010 and they focused on determining the sensory and physical – chemical analyses by methods existing in the specific state standards and by the methodology in this particular domain.

Keywords: white wine, denomination of origin, maturation, physical – chemical composition

1. Introduction

In terms of an increasing competition on the wine market and as a result of accession to the Europe Community, the question arises as to obtain some wines with controlled appellation of origin. The wines which meet the requirements of European Union are those in the viticultural centre of Jidvei, Tarnave vineyard.

The most representative varieties of this area are: Feteasca regala, Riesling Italian and Muscat Ottonel. They have sensory characteristics and physical – chemical composition superior to other varieties grown in this vineyard area.

Feteasca regala is the wine which dominates quantitatively the dry white which wines. It is much appreciated for its freshness and fruitiness.

Riesling Italian is a white wine which is characterized by freshness and a flavor of exotic fruits.The fragrance and flavour of Muscat Ottonel are reminiscent of the ripe grapes, similar to the flavour of citrus flowers. It is a wine of great success both in our country and abroad.

The continentally temperate, moderate climate is expressed by thermal parametres available to viticulture.

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The annual average temperature was good 10.75°C in 2009 compared to 2010 when the average temperature was 9.6°C, which resulted in relatively constant accumulation of sugar, thus obtaining high quality wines during the years of study. Recorded precipitation, as well as well – proportioned temperatures created favourable conditions for the superior ripening of grapes and high accumulation of sugar in 20009.

The phytosanitary condition of crops was good, the varieties had resistance to grey mold attack in 2009, compared to 2010 when the attack of grey mold was emphasised especially towards the end of the phenophase maturation of grapes.

2. Materials and methods

Experiments were carried out in the viticultural centre Jidvei, Tarnave vineyard between 2009 – 2010 on the varieties Feteasca regala, Riesling Italian and Muscat Ottonel aiming at:

- The use of healthy grapes picked at full maturity, which influences the composition of musts and wines by variety, degree of maturation health and physical – chemical composition;
- Antioxidant protection;
- Separation of must;
- Decanting must at temperatures of 10 - 12°C during 12 – 24 hours;
- Controlled fermentation at low temperatures ranging from 14 to 18°C;
- The end of alcoholic fermentation by analyzing the sugar content and the antioxidant protection of young wines;
- Separate wine from yeast 5 – 10 days after the completion of alcoholic fermentation;

The observations and determinations were made to:

- Determine the main physical – chemical components of wine (vol % alcohol, volatile acidity g/l CH_3-COOH, total acidity g/l H_2SO_4 , total acidity g/l $C_4H_6O_6$, sugar g/l , pH, extract g/l) in order to obtain wines with controlled appellation of origin;
- Interventions in the prefermentation phase;
- Controlled alcoholic fermentation;
- Stop alcoholic fermentation by intervention with sulphur dioxide and heat shock.

Processing of grapes, prefermentative activitis, controlled fermentation of must, care and conditioning of wines were made at the winery complex Jidvei.

3. Results and Discussion

Based on the experimental conditions for wines in the harvest years 2009 – 2010, there have been obtained wines with appellation of origin with the following characteristics:

Table 1. Physical and chemical characteristics of wine in 2009

Variety	Volatile acidity g/l CH_3-COOH	Total acidity g/l H_2SO_4	Total acidity g/l $C_4H_6O_6$	Extract nered. g/l
FETEASCA REGALA	0.43	4.26	6.52	23.4
RIESLING ITALIAN	0.44	4.10	6.27	22.2
MUSCAT OTTONEL	0.48	4.05	6.19	24.3

Table 2. Physical and chemical characteristics of wine in 2010

Variety	Volatile acidity g/l CH_3-COOH	Total acidity g/l H_2SO_4	Total acidity g/l $C_4H_6O_6$	Extract nered. g/l
FETEASCA REGALA	0.40	4.94	7.55	21.2
RIESLING ITALIAN	0.37	5.04	7.71	20.6
MUSCAT OTTONEL	0.44	3.87	5.92	21.9

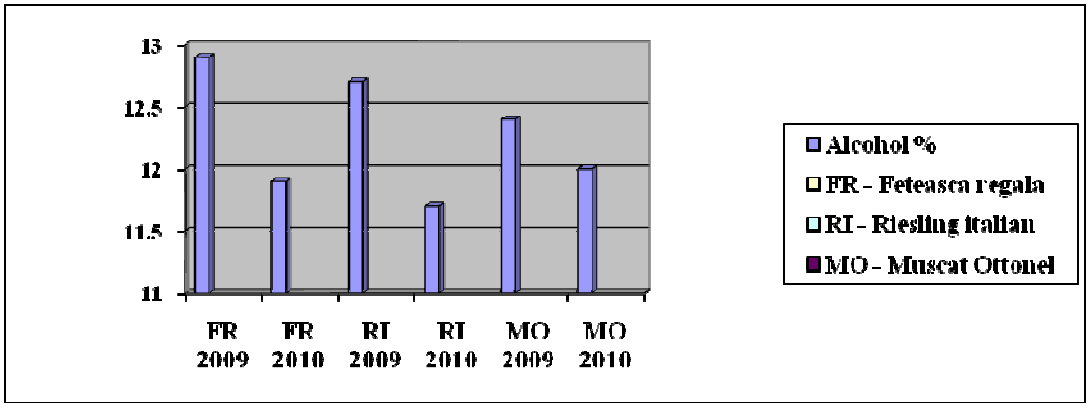

Figure. 1. Alcohol Concentration

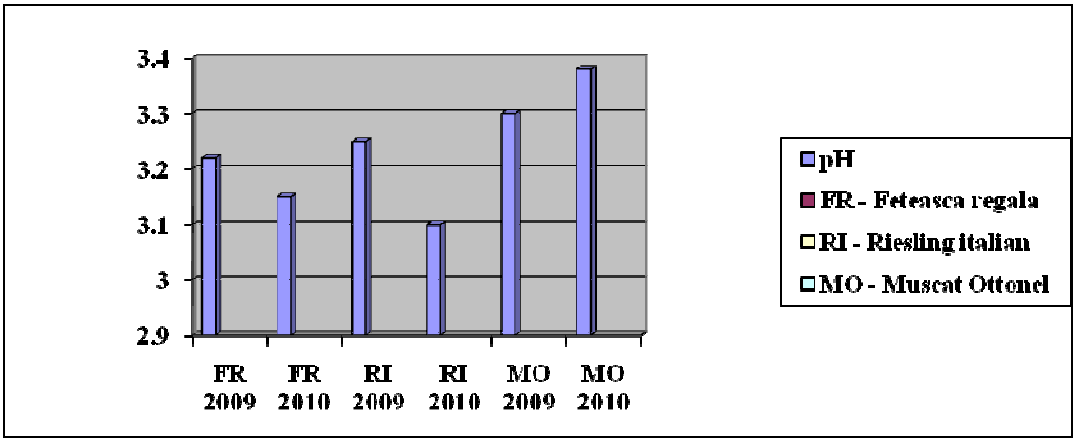

Figure. 2. pH values

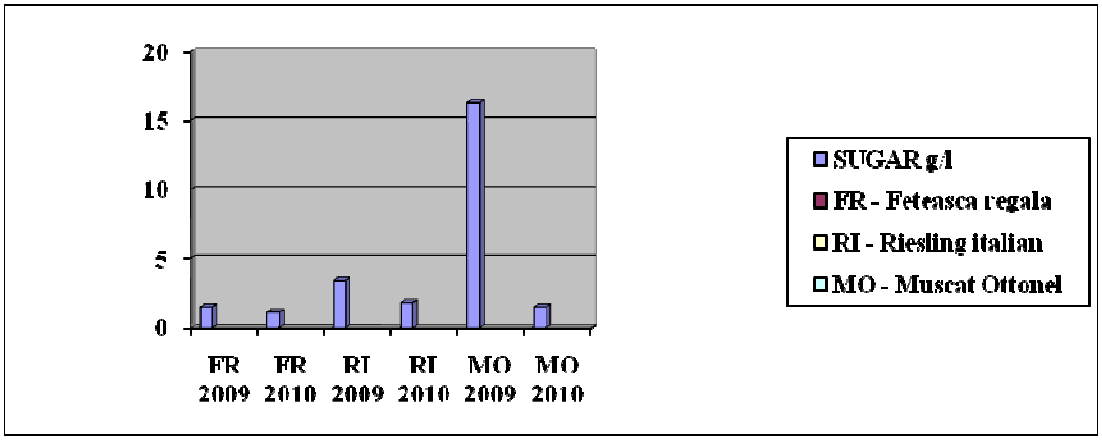

Figure. 3. Sugar concentration

In 2009 the sugar accumulation in berries was high and it led to the increase of alcoholic concentration and to obtain dry wines, except the variety Muscat Ottonel harvested in 2009 compared to 2010.

There were recorded pH values within normal limits with a special importance in wine technology, since they influence directly the taste, clearness and evolution of wines.

Feteasca regala wines, produced during the experimental period in Jidvei wine centre, are clear, yellow with greenish hues, and with time they develop into straw yellow with an alcohol concentration of 11,7 – 12,7% vol, total acidity varying between 4,26 – 4,96 g/l H2SO4 , which gives the wine freshness and vivacity, while the dry non – reducing extract has values ranging between 21,2 – 23,40 g/l with a special fruitiness, and the volatile acidity has values between 0,40 – 0,43 g/l this way obtaining balanced and harmonious wines.
Riesling Italian wines under study are white, clear with yellow – greenish reflex, they have an alcohol concentration ranging between 11,5 – 12,5 % vol., total acidity between 4,10 – 5, 04 g/l H2SO4 , while the dry non – reducing extract has values between 20,6 – 22,20 g/l, resulting this way in savoury, tasty wines which are characterised by freshness and slight exotic fruit aroma.

Muscat Ottonel wines, produced in the experimental period are balanced aromatic wines of straw yellow to gold, having an alcohol concentration between 12,0 – 12,4 % vol. the total acidity has lower values, these are between 3, 87 – 4,05 g/l H2SO4 , while the dry, non – reducing extract has values between 21,9 – 24,3 g/l and the volatile acidity ranged between 0,44 – 0,48 g/l.

They are preferred both as young and old mature wines when the bouqet of the wine becomes distinct, full and complex.

4. Conclusion

The wines produced in the viticultural centre of Jidvei, due to the specific climatic conditions, are with controlled appellation of origin, and special qualities are found in the varieties of grapes: Feteasca regala, Riesling Italian and Muscat Ottonel. Very good results were obtained by the processes of maturation in oak barrels, stored at temperatures between 9° - 11°C, to improve smell and taste features.

The process is considered finished after four months of storage in these conditions.During the maturation process the wines gradually pass from light green to greenish – gold or yellow – gold and in terms of taste become more " round".

Both the physical – chemical and sensory analyses of wines showed that during the processing of grapes, the must obtained immediately is sulphitized with a solution or liquefied SO2, until the level of concentration reached the minimum 15 – 25 mg/l free SO2. Decanting of must and use of temperature between 14 - 18°C depending on variety and achievement of decanting after 5 – 10 days from the completion of alcoholic fermentation, followed by a maturation in oak barrels under the above described conditions leads to products obtained properly and with special sensory attributes.

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