

# THE AGROPHYTOTECH AND TECHNOLOGY STUDY OF VARIETY FETEASCA REGALA GROWN IN AREA CULTURE DIFFERENT

## STUDIUL AGROFITOTEHNIC ȘI TEHNOLOGIC AL SOIULUI FETEASCĂ REGALĂ CULTIVAT ÎN AREALE DIFERITE DE CULTURĂ

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**Abstract.** In Romania, white wine the assortment is composed essentially of Fetească regală (17.9%), Fetească albă (10.9%), Riesling Italian (10%), Aligoté (6.5%). Fetească regală is with the widely spread variety in Romanian vineyards. Is equally vineyards in Moldova (Covurlui, Odobești, Iasi, Cotesti, Panciu, Vaslui), in Muntenia (Big Hill, Stefanesti-Arges) in Transylvania (Tarnave Sebes, Aiud), and others. Starting from the premise that climatic factors have a role in the success of the culture and quality of wines produced was considered Fetească regală evaluation in terms of tolerance to a biotic and biotic the stress factors. The research was made in 2012, atypical year for the vines, in seven viticulture areas RDSVV Bujoru, RDSVV Iasi RDIVV Valea Călugărească, RDSVV Odobesti, RDSVV Pietroasele, and RDSVV Murfatlar RDSVV Blaj.

**Key words:** abiotic stress, production, quality, adaptability

**Rezumat.** În România, sortimentul pentru vinuri albe este alcătuit, în principal, din soiurile Fetească regală (17,9%), Fetească albă (10,9%), Riesling italian (10%), Aligoté (6,5%). Soiul Fetească regală este soiul cu cea mai largă răspândire în podgoriile românești. Se găsește în egală măsură în podgorii din Moldova (Covurlui, Odobesti, Iași, Cotesti, Panciu, Vaslui), în Muntenia (Dealul Mare, Stefanesti-Arges), în Transilvania (Tarnave, Sebes, Aiud), și altele. Plecând de la premiza că factorii climatici au un rol determinant în reușita culturii și a calității vinurilor obținute, s-a avut în vedere evaluarea soiului Fetească regală din punct de vedere al toleranței la factorii de stres abiotici. Cercetările au fost realizate în anul 2012, an atipic pentru cultura viței de vie, în șapte areale viticole SCDVV Bujoru, SCDVV Iași, ICDVV Valea Călugărească, SCDVV Odobesti, SCDVV Pietroasele, SCDVV Murfatlar, SCDVV Blaj.

**Cuvinte cheie:** stres abiotic, producție, calitate, adaptabilitate

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## INTRODUCTION

The most important issue that should be considered is Romanian viticulture confrontation with the world market (Tardea and Dejeu, 1995). This desideratum can only be achieved by establishing vineyards effective exploitation technologies, technology varieties, including autochthonous perspective, increasing the degree of mechanization of work and cost recovery products (Tardea and Rotaru, 2003).

## MATERIAL AND METHOD

They made observations and measurements on the registration and data processing meteorological and phenological observations, consistent with the biological requirements of the vine. As the meteorological factors important for climate characterization were studied temperature, precipitation and humidity. The main vegetation phases (first fruits, maturation grape and leaf fall) were made observations concerning some of biological thresholds. The statistical interpretation of the results on the quality and productivity of genotypes at harvest was done using Duncan test (Irimia, 2012) using SPSS version 10 (SPSS Inc. Chicago, IL, USA). The data were interpreted by analysis of variance (ANOVA), the separation was done with Duncan test environments at  $P \leq 0.05$ . The interaction of the species was evaluated by selecting  $P \leq 0.0001$   $P \leq 0.01$  and  $0.05 \leq P$  to establish the significance.

## RESULTS AND DISCUSSIONS

For the characterization Fetească regală variety of tolerance to abiotic stress main factors in the vegetation period were made observations and measurements on the registration and data processing meteorological and phenological observations, consistent with the biological requirements of the vine.

Analyzing the figures we is found that the period from July to September was very droughty with patchy distribution of precipitation. In August Dealu Bujoru vineyard, Tarnavelor vineyard, and Dealu Mare vineyard (RDSVV Pietroasele) has been an absolute maximum temperature over  $40^{\circ} \text{C}$  (Fig. 1). Since July 2012 rainfall decreased sharply accentuated droughts and temperatures far higher than normal in the months of July August and September (Fig. 2).

In all vineyards and wine centers studied, installed both the thermal and hydric stress. Foliage sometimes suffered burns which affect photosynthesis. Also were affected the bunches on the sunny part of the berries is slightly raisined and following grape production was reduced.

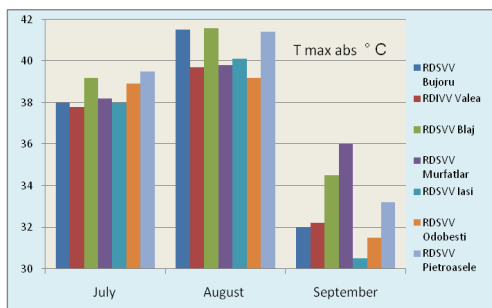


Fig. 1 - Thermic regime in 2012

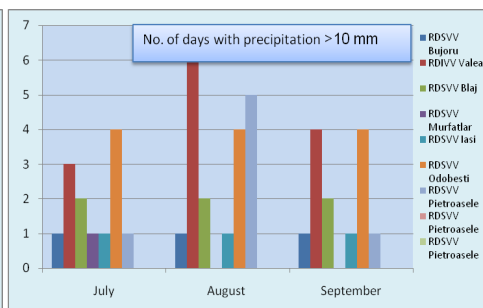


Fig. 2 - Hydric regime in 2012

Studied in direct correlation with the climatic conditions of the ecosystem, the variety along of vegetation phenophases specific the research period differently, being bringing forward to the normal years.

Analyzing the Figure 3 points out that Fetească regală variety, behaved differentiated depending on the area of culture and is proving that in order to carry out the complete cycle of vegetation require different useful temperatures. This thing proves us that the variety has adapted to the climatic conditions in which it is cultivated. It is also worth mentioning that 2012 was an atypical year for optimal growth and development of the vine, and climate events that have succeeded since the beginning of vegetation have influenced the in a negative way deployment vegetation phenophases. An aspect that it is noted at the variety Fetească regală is that although flowering phenophase was made on June 4 at RDSVV Blaj and RDSVV Murfatlar, there is a very significant difference between the two areas in terms  $\Sigma tu \text{ } ^\circ \text{C}$ , namely  $+ 152.8$  ( $RDSVV \text{ Blaj} = \Sigma tu \text{ } ^\circ \text{C} = 278.2 / RDSVV \text{ Murfatlar} = \Sigma tu \text{ } ^\circ \text{C} = 431$ ). Also entered the Fetească regală variety, the first fruits and reached technological maturity as early to RDSVV Bujoru. This phenomenon has been achieved due to irreversible wilting in the grapes which resulted in their forced maturation.

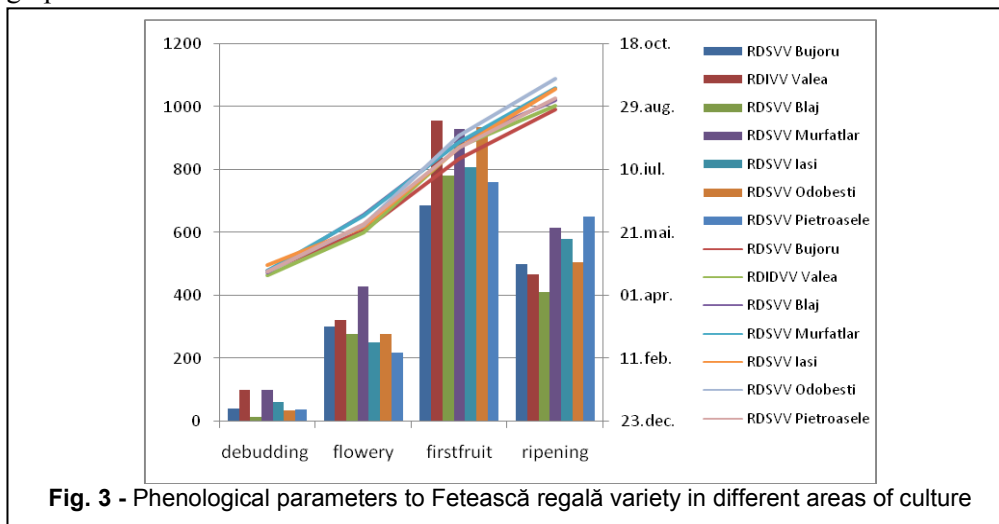


Fig. 3 - Phenological parameters to Fetească regală variety in different areas of culture

To highlight the influence of the area on indices of quality of the grapes was performed statistical interpretation of quality and productivity at Fetească regală grapes. Analyzing the Table 1, we can conclude that atypical climatic conditions recorded in 2012 the Fetească regală variety, performed best in Vineyard Odobești followed by vineyards Târnavă and Murfatlar.

Table 1

**Quality and grape production at the Fetească regală variety 2012**

Vineyard / Center Wine	Characteristics physico-chemics				Average production kg/vine
	Sugar (g/l)	Acidity (g/l H <sub>2</sub> SO <sub>4</sub> )	Weight 100 berries (g)	Average weight of grapes(g)	
RDSVV Bujoru	171± 6,0 (d)	<b>4,8 ± 0,2(a)</b>	63 ±16,64 (c)	42± 8,88(d)	1,54 ±0,2(c)
RDIVV Valea Călugărească	196± 2,0 (c)	<b>4,3± 0,3 (a)</b>	<b>115±3,0 (b)</b>	<b>89±3 (b)</b>	<b>2,4±0,24 (a)</b>
RDSVV Blaj	<b>210,6 ± 2,0(b)</b>	<b>3,29 ±0,1(b)</b>	<b>168,03±2,67(a)</b>	<b>108,15±5,2(a)</b>	<b>2,14±0,2(b)</b>
RDSVV Murfatlar	<b>217,2± 2,3 (a)</b>	<b>3,2 ± 0,3(b)</b>	<b>131 ± 5(b)</b>	<b>108 ±2 (a)</b>	<b>2,13±0,2(b)</b>
RDSVV Iași	<b>212 ±12,0(b)</b>	<b>3,6 ± 0,5(b)</b>	<b>122 ± 33.3(b)</b>	66±5,5 (c)	<b>2,1±0,16(b)</b>
RDSVV Odobești	<b>223,5 ± 2,2 (a)</b>	<b>4,4 ±0,26 (a)</b>	<b>160a±2(a)</b>	<b>100±2(a)</b>	<b>3,5±0,31 (a)</b>
RDSVV Pietroasele	<b>208 ± 3,0 (b)</b>	2,88 ± 0,6 (c)	66 ± 5 (c)	<b>96 ±2(b)</b>	1,53±0,11(c)
<b>LSD 5%</b>	<b>3,90-6,28</b>	<b>0,26-0,42</b>	<b>10,35-16,64</b>	<b>3,4-5,48</b>	<b>0,13-0,21</b>

Statistical results confirm that the area has a very significant influence the variety. Correlation analysis was performed between the areas of culture and physical characteristics - chemical properties of grapes.

Table 2

**Correlation to Fetească regală variety**

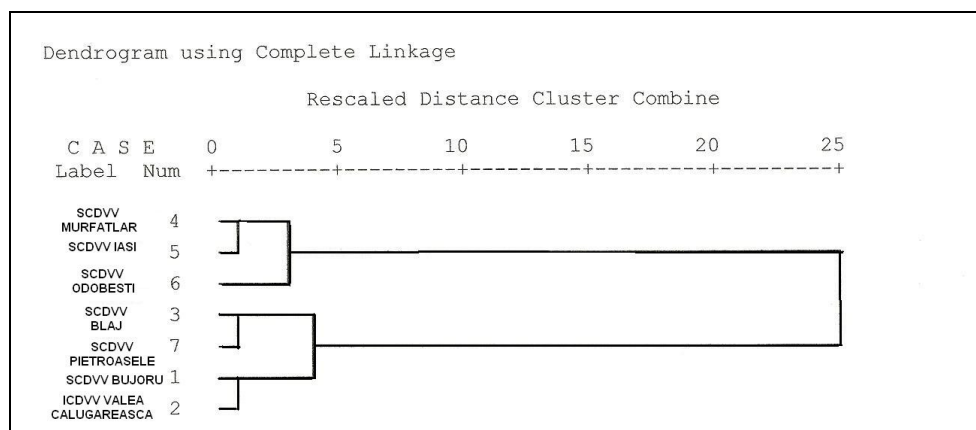
		Area	$\Sigma T_{usable}$ °C	Average production (kg/vine)	Average weight of grapes (g)	Sugar (g/l)	Ripening date
Area	Pearson Correlation	1	0,141	0,235	0,446	0,770(*)	0,707
	Sig. (2-tailed)		0,763	0,612	0,316	0,043	0,076
$\Sigma T_{usable}$ °C	Pearson Correlation	0,141		-0,405	0,258	-0,333	-0,06
	Sig. (2-tailed)	0,763		0,368	0,576	0,465	0,898
Average production kg/but	Pearson Correlation	0,235	-0,405	1	0,401	0,526	0,684
	Sig. (2-tailed)	0,612	0,368		0,373	0,225	0,09
Average weight of grapes (g)	Pearson Correlation	0,446	0,258	0,401	1	0,439	0,452
	Sig. (2-tailed)	0,316	0,576	0,373		0,324	0,308
Sugar g/l	Pearson Correlation	0,770(*)	-0,333	0,526	0,439	1	0,871(*)
	Sig. (2-tailed)	0,043	0,465	0,225	0,324		0,011
Ripening date	Pearson Correlation	0,707	-0,06	0,684	0,452	0,871(*)	1
	Sig. (2-tailed)	0,076	0,898	0,09	0,308	0,011	
* Correlation is significant at the 0.05 level (2-tailed).							

Table 2 is statistical points of view represent a correlation matrix. The correlation coefficient indicates the intensity of the relationship, so  $Cc = + 1$  indicates a perfect direct relationship between variables, and a  $Cc = -1$  indicates a perfect inverse relationship. It show signifies correlation (coefficient values very close to 1), the quantity of sugar and maturation time ( $Cc = 0.871$ ) between the amount of sugar and the area of culture ( $Cc = 0.770$ ). The standard deviations show that the variety differs significantly in terms of tolerance culture conditions. (Sig = 0, 0).

The Cluster analysis was performed by using the variable chemical and physical characteristics of the grapes at the Fetească regală variety. The grouping was done on evaluating dissimilarities between cases. Agglomerative hierarchical analysis was chosen by plotting the chart type cluster dendrogram format. The dendrogram representing the distances between the elements that are processed together on a scale 0-25 with keeping ratio distances. Dendrogram shows agglomeration program clusters: the value that united classes.

The dendrogram analyzing shows that the iterative process begins with two groups of somewhat homogeneous classes.

The level of aggregation than 5 is restricted to three groups, which are represented by the three clusters. Given the set of indicators considered for grouping concerning dissimilarity varietal wine areas have highlighted these clusters C1= RDSVV Murfatlar- RDSVV Iasi – RDSVV Odobesti, C2= RDSVV Blaj – RDSVV Pietroasele, C3= RDSVV Bujoru – RDIVV Valea Calugarească.

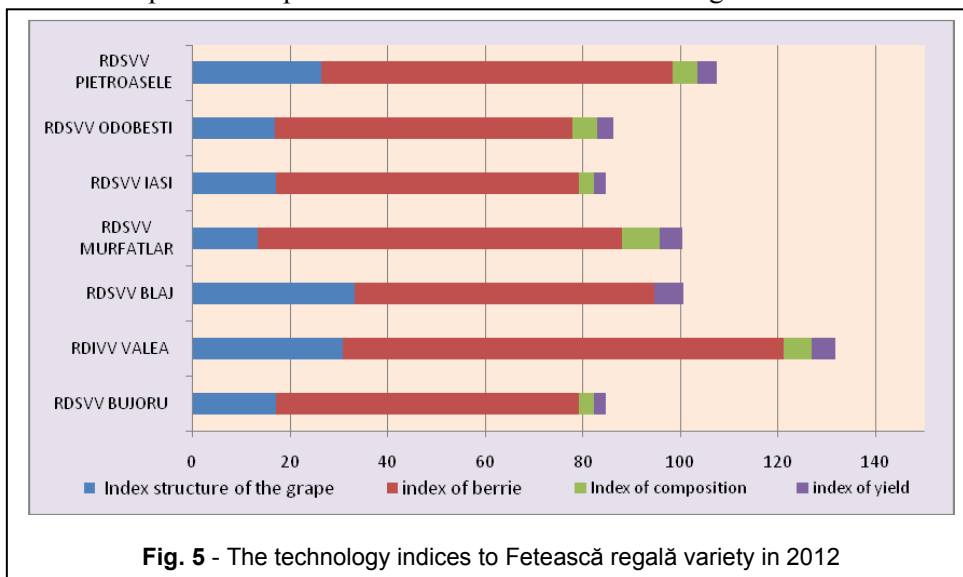


**Fig. 4** - The grouping to Fetească regală variety on areas of culture

Technological indexes values of the grape variety complement technological characterization.

The data obtained from these indices determine at the Fetească regală variety that grape index structure (Figure 5) was performed over 30 only RDSVV Blaj, RDSVV Pietroasele and RDIVV Valea Călugărească which shows that grapes were well-constituted high yield grains compared to other viticulture areas.

In the RDSVV Bujoru and RDSVV Iași, the Fetească regală variety, has not reached the production parameters for the direction of falling.



## CONCLUSIONS

1. Under the action of the stress factors abiotic, the Fetească regală variety behaved differently depending on the area of culture.
2. The research confirms that variety had a high tolerance to stress factors in Târnave Vineyard, Dealu Mare Vineyard and Murfatlar Vineyard.

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