THE EVOLUTION OF THE CLIMATIC ENVIRONMENT SPECIFIC TO THE RECAŞ VITICULTURE AGRO ECOSYSTEM

EVOLUȚIA MEDIULUI CLIMATIC SPECIFIC AGROECOSISTEMULUI VITICOL RECAŞ

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Abstract: *This paper shows the results of the climatologic studies made at the viticulture agro ecosystem of Recaş. They emphasise the quality vocation of the viticulture agro ecosystem under study, the optimal and restrictive climatic factors, as well as their evolution during the last decades.*

Rezumat: *Această lucrare face cunoscute rezultatele studiilor climatologice executate asupra agroecosistemului viticol Recaş. Ele subliniază vocația referitoare la calitate a agroecosistemului viticol luat în studiu, factorii climatici optimi şi restrictivi, cât şi evoluția acestora de-a lungul deceniilor trecute.*

Key words**:** *climatic environment, Recaş viticulture agro ecosystem*
Cuvinte cheie: *mediu climatic, agroecosistemul viticolRecaş*

INTRODUCTION

The climatic environment, which is specific to a certain region, also to a viticulture area, is not constant in time. There are registered permanent variations, depending on the climate region. The evolution of the climate can be shown by analysing the data recorded on a longer period and by their interpretation.

MATERIAL AND METHOD

The studies were made during 1961-1970, 1991-2001 and 2002-2006 period, and these dates were observed and interpreted. Some binary and ternary indexes were calculated in order to show the interaction between the climate factors which not action separately, but simultaneous.

Their interpretation was possible by checking up the information from the speciality literature.

RESULTS AND DISCUSSIONS

Analysing the decade 1961-1970 it comes out that it was characterised by an average annual temperature of $10,6^0$C. In addition, during the same period the real insolation hours reached 1519 hours value.

Observing hydrothermal coefficient value of 1.11 (Table 1) we may assert that Recaş viticulture agro ecosystem has favourability for superior wines production taking into consideration the relation between hydrothermal coefficient and wines quality category:

In the following decade, 1991-2001 the sum of temperatures for the studied interval was 4018.16^0C corresponding to optimal condition for grapes cultivation. Average sun light duration was 2170.81 hours per year good enough for white vine or table vine with early and medium maturation, while late species are to be avoided.

Climatic resources can be better put in value using several binary and ternary indexes.

Table 1

Climatic characteristics of the viticulture agro ecosystem of Recaş. Average values (1961-1970)
(After Şt. Teodorescu, 1987)

Average annual temperature (^{0}C)	Amount of rainfall/year (mm)	Amount 1 IV-30 IX			Hydrothermal coefficient (Seleaninov) (CH)
		Active thermal balance (^{0}C)	Real insolation (hours)	Rainfall (mm)	
10.6^{0}C	636	3206	1519	364	1,11

Table 2

Relation between hydrothermal coefficient (CH) and wines quality category
(After M. Oşlobeanu, 1980)

Hydrothermal coefficient (CH) value	Wines quality category
0,6-1	Half dry and sweet wines
1,1-1,5	Superior wines
1,6-2,0	Current consumption wines

Table 3

Climatic indexes (1991-2001)
(After A. Cozma, 2002)

Index	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Average
I.H	3.8	4.9	4.3	6.15	4.2	4.4	3.9	4.6	4.75	4.78	4.57	4.57
I_{bcv}	2.16	4.55	5.94	5.37	1.96	2.46	2.23	4.23	2.95	8.77	5.6	4.89

In this period it was noticed that the heliothermal index (I.H) reached values between 3.8 (1991) and 4.78 (2000) (Table 3). We may assert that the optimal value for vine is higher than 2.6. This index characterise both sun light and temperature and it was calculated for the first time by I.Branas in 1946.

Another index, which was analysed, was the bioclimatic index (I_{bcv}). It offers a simultaneous evaluation of temperature, insolation, and humidity. I_{bcv} values from our country vary between 5 and 15. Values lower than 5-7 shows rich hydric resources and lower heliothermal resources. This study reveals that the year 2000 was an exception, with a value of 8.77(droughty year), 1991, 1995 and 1999 were considered to be rainy and these values were excluded from multiannual average.

Table 4

The climatic characteristics of the viticulture agro ecosystem of Recaş

Year	Average temperature (^{0}C)		Thermal balance (^{0}C)		Real insolation (hours)	Rainfall (mm) 1 IV-30 IX	Heliothermal index (I.H)	Bioclimatic index (I_{bcv})
	Annual	The hottest month	Active	Available				
2002	12.12	24.2	3475.8	1645.8	1511	365.8	2.48	7.84
2003	10.95	24.2	3552.8	1722.8	1695	304.9	2.92	10.79
2004	11.10	22.5	3265.9	1435.9	1504	337.8	2.15	7.94
2005	10.75	21.2	3356.2	1526.2	1526.8	466.5	2.33	6.00
2006	11.08	24.0	3360	1530	1371	390	2.09	6.45
Average	11.2	23.22	3402.1	1572.1	1521.5	373	2.39	7.80

The last period of our study, (2002-2006) is characterised by an increase of the annual average temperature compared to the seventh decade.

Vineyard needs an optimal temperature of 9-10 ^{0} C that is considered the lowest value of temperature when the vegetation period begins. Therefore, the values registered during our study period are higher than this temperature: 11.1^0 C in (1991-2001) period and 11.2 ^{0} C in (2002-2006) period.

The average temperature of the hottest month, higher than 19^{0}C shows that the viticulture area offers good climate conditions in order to obtain superior wines and if that value overcomes 21^{0}C we talk about quality wines with origin denomination. In our case the average value of 23.22 shows that these requests are fulfilled.

The highest values of both thermal balances, active and available were registered in 2003. In this year has been observed an increase of 150.7^{0}C of the active balance, having in mind the multiannual average of 3402.1 and of 196^{0}C in comparison with (1961-1970) period.

In 2006 was registered the lowest real insolation value, of 1371 hours, which has shown a decrease of 150.5^{0}C in comparison with the multiannual average of 1521.5 and also with 1519 value registered in (1961-1970) period.

Hydric resources of 373 mm from (2002-2006) period are characterized through the increase of their level compared to the seventh decade of the last century, when their average value from 1IV-30IX was 364 mm. In the year 2005 has been identified the highest level of rainfall during the vine vegetation period (Table 4).

In 2003 bioclimatic index value reached 10.79, this fact reminding us about the highest heliothermal resources of the period (2002-2006).

CONCLUSIONS

1. Based on the interpretation of the binary and ternary indexes calculated in this paper through the studied period we may assert that Recaş viticulture agro ecosystem climatic evolution it is a proper one to vineyard cultivation.
2. The climatic information provided by CMR Banat-Crisana and also the specialty literature consulted confirms Recas viticulture agro ecosystem potential for white and red wines production, but most of all for the obtaining process of quality wines with origin denomination.

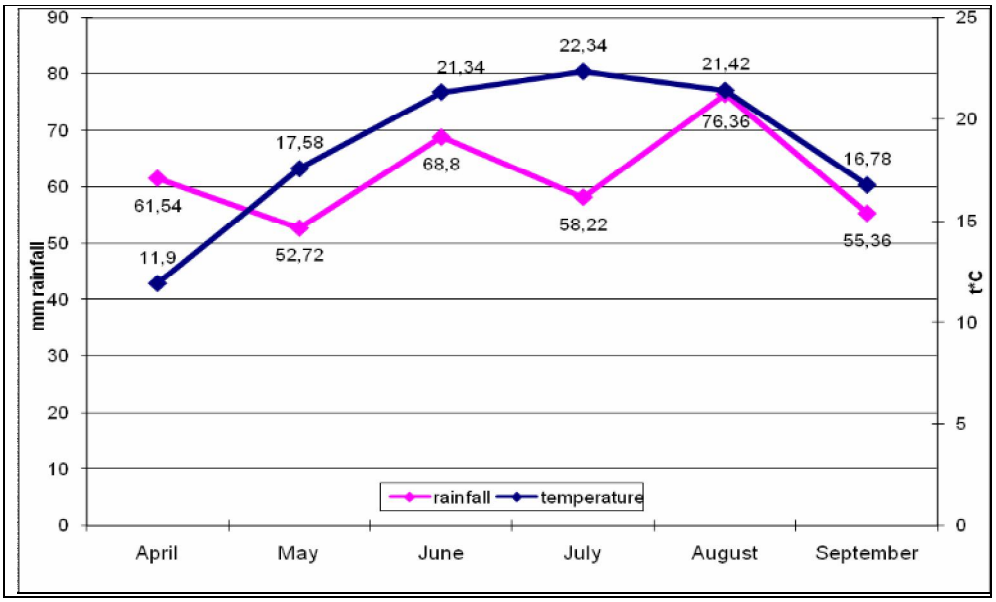

Figure 1 The climogram of Recaş viticulture agro ecosystem (2002-2006)

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