

AGRO ECOLOGICAL CONDITIONS FOR VITICULTURE DEVELOPMENT IN GEVGELIJA REGION

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Abstract

In this publication detail climate analysis of air temperature, length of sun glow and rain quantities has been made for the Gevgelija-Valandovo region for period 1961/1990, 1991/2000 and 2001/2009.

Climate-viticulture bulletin has been made for viticulture requirement. Climate index and coefficients have been determined in the examined area. Only careful and right choice of viticulture and climate analyses can contribute to result in quality and quantity manufacturing of viticulture.

Key words: climate, climate-viticulture bulletin, Gevgelija-Valandovo region

Introduction

Three vineyard areas have been determined in Republic of Macedonia according the climate-soil conditions and specifications of the products. The areas are: Pelagonisko-Poloski, Povardarski and Pcinsko-Osogovski vineyard area. Povardarski vineyard area is formed of the following areas: Skopje, Veles, Tikves, Gevgelija-Valandovo, Strumica-Radovis, Ovcepole, Kocansko-Vinica vineyard area. Gevgelija-Valandovo vineyard area is situated in southeast part of Republic of Macedonia. Part for this vineyard is also the area surrounding Dojran Lake. Following areas are part from this vineyard: Gevgelija, Valandovo and Bogdanci (Dojran) (Bozinovik Z., 2005).

In commercial and economical effect of the vineyard great influence have viticulture's with agro ecological conditions that allow production of grape with superior quality. Gevgelija-Valandovo is vineyard with optimal conditions for raising superior grape. In this vineyard especially significant are micro regions that posses specific micro climatic conditions suitable for rising breeds with different types of biological and technological characteristics. This brand has great potential but only if a god abutment is made between agro ecological conditions, qualitative features of grape variety and the market.

Material and method

For agro ecological conditions analyses in Gevgelija and the advantageous for rising viticulture, data from Administration for hydrometeorology, Skopje, was used. Data was retrieved for a meteorological station in Gevgelija for period from 1961 till 1990, 1991/2000 and 2001/2009 with purpose to gain complete agro ecological image for the examined area. Coefficient and index calculations were made according determined methodologies in climatology statistics. Climatological and meteorological elements are processed in details, elements that have great influence in viticulture development (Ilik Popova Srebra, 2003, Petrovikj Nevena, 1995).

Results and discussion

Table 1 shows the results for average month, year and vegetation air temperature. The conclusion from the data presented is following: average year air temperature is between 14.0 and 15.4 °C and average vegetation temperature is between 19.6 and 21.2 °C. In comparison with the period from 1961/1990 both average year and vegetation air temperatures show higher values. High air temperature values can be observed in May and June. Hottest month is July. Summer heat continues to be present in September (for the examined period, average value in September is 20.5 °C). Autumn (in average for the examined period is 15.0 °C) is warmer then spring (14.0°C). The transmit ion for winter to summer is with clearly emphatic spring.

Tabela 1. Prosečne mesečne i vegetacione temperature vazduha u Devdelii, 1961/1990, 1991/2000 i 2001/2009

Table 1. Average month and vegetation air temperature (°C) in Gevgelija, 1961/1990, 1991/2000 and 2001/2009

Period Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XI I	IV- X
2001/200 9	4. 8	6. 2	10. 1	14. 0	19. 9	24. 5	27. 2	26. 4	20. 7	15. 6	9. 5	5.3	21.2
1991/200 0	4. 2	5. 7	8.8	13. 7	19. 2	24. 4	26. 4	26. 2	20. 8	15. 3	9. 7	5.2	20.9
1961/199 0	3. 3	5. 3	8.7	13. 4	18. 3	21. 9	24. 9	24. 1	20. 1	14. 2	8. 9	4.8	19.6

Temperature sums are shown for the examined period. Year temperature sum ranges between 5204 till 5626 °C and vegetation temperature sum ranges between 4243 till 4541 °C. In comparison with the examined period 1961/90 both examined periods have greater values for temperature sums.

Tabela 2. Prosečne mesečne i vegetacione temperature sume, 1961/1990, 1991/2000 i 2001/2009

Table 2. Average month, vegetation sum (°C) in Gevgelija, 1961/1990, 1991/2000 and 2001/2009

Period Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	IV-X
2001/2009	149	174	312	421	616	736	843	819	622	484	285	165	4541
1991/2000	129	160	271	410	595	732	818	813	625	473	290	161	4466
1961/1990	102	164	270	415	567	679	772	747	623	440	276	149	4243

Gevgelija area is one of the warmest areas in Republic of Macedonia. Based on warmth analyses it is determined that Gevgelija area is suitable for different types of viticulture's.

Gevgelija area has absolute maximal air temperature of 44.3 °C for the period of 1961/90 determined on 06.07.1988. The value is 44.6 °C for the period 1991/00 (05.07.2000) and for the period 2001/09, 45.3 °C (24.07.2007).

Tabela 3. Apsolutni mesečni i godišnji maksimum temperature vazduha, 1961/1990, 1991/2000 i 2001/2009

Table 3. Absolute month and year maximum of air temperature (°C) in Gevgelija, 1961/1990, 1991/2000 and 2001/2009

Period Period	I	II	III	IV	V	VI	VII	VII I	IX	X	XI	XII	Tx
2001/200 9	20. 2	26. 2	28. 5	30. 6	37. 5	42. 6	45. 3	42. 3	39. 2	34. 6	29. 0	20. 0	45. 3
1991/200 0	19. 5	22. 2	25. 6	29. 6	35. 3	39. 4	44. 6	43. 3	37. 2	33. 6	26. 6	21. 9	44. 6
1961/199	19.	22.	28.	31.	37.	40.	44.	41.	38.	33.	27.	19.	44.

0	5	2	2	0	0	0	3	4	6	6	0	0	3
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High values of heat regime in Gevgelija area are manifested through the increased number of summer and tropical days.

As consequence of the opened approach to north during winter months very low air temperatures occur in Gevgelija. Absolute minimum air temperature in Gevgelija has the value of -19.5 °C for the period 1961/90 determined on 27.01.1963. The value is -16.0 °C for the period 1991/00 (25.12.1999). For the period 2001/09 the value is -12.3 °C (27.01.2006). Absolute minimal year temperature mostly occurs in January.

Tabela 4. Apsolutni mesečni i godišnji minimum temperature vazduha 1961/1990, 1991/2000 i 2001/2009

Table 4. Absolute month and year air temperature minimum (°C) in Gevgelija, 1961/1990, 1991/2000 and 2001/2009

Period Period	I	II	III	IV	V	VI	VII	VII I	IX	X	XI	XII	Tn
2001/2009	-	-	-	-	5.	10.	12.	14.	6.	-	-	-	-
9	12.3	-8.4	8.5	4.4	2	2	6	0	4	0.0	5.0	10.2	12.3
1991/2000	-	-	-	-	3.	-	12.	-	4.	-	-	-	-
0	12.6	12.2	9.0	3.0	5	9.8	0	9.6	6	1.0	8.4	16.0	16.0
1961/1990	-	-	-	-	2.	-	-	-	0.	-	-	-	-
0	19.5	15.0	8.0	3.0	5	5.1	8.4	6.8	0	5.7	6.4	10.0	19.5

Average year rain sum in the examined period is 690.7 and ranges between 633.0 till 763.6 mm. Average vegetation rain sum in the examined period is 350.0 mm and ranges between 304.6 till 414.3 mm. During the year rain fall is unequally allocated in seasons and months. Rainiest periods are November, December and October by order in period 1961/90 and 91/00. Lowest rain fall is determined in July and August. In some years month quantities fluctuate and deviate from the average month values. Although rain falls are with high values, drought periods are frequent. The value of the hydrothermal coefficient is 0.67.

Tabela 5. Mesečne sume padavina (mm), 1961/1990, 1991/2000 i 2001/2009

Table 5. Month sums of rain (mm) in Gevgelija, 1961/1990, 1991/2000 and 2001/2009

Period Period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2001/2009	76.6	36.5	57.3	53.8	60.7	75.0	41.1	38.8	56.3	88.7	67.9	110.9
1991/2000	64.5	45.8	44.6	51.0	54.7	33.6	41.0	27.5	34.8	62.0	87.9	85.6
1961/1990	48.8	64.1	65.4	54.0	64.3	44.8	30.2	35.4	31.8	69.5	93.1	74.1

Gevgelija area is one of the areas with longest duration of sun glow in Republic of Macedonia. Year sum of sun glow in the examined period has the value of 2404.0 h and vegetation sum is 1771 h. Heliothermal coefficient is 6.7. This value

gives the information about many warm and shiny days needed for viticulture development.

Tabela 6. Mesečne sume sunčevog zračenja, 1981/2009 i 2001/2009

Table 6. Sun glow duration (h) in Gevgelija, 1981/2009 and 2001/2009

Period <i>Period</i>	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2001/2009	115	138	172	181	269	286	331	318	219	168	125	85
1981/2009	122	128	166	194	251	289	328	313	233	162	116	99

Tabela 7. Srednje mesečne i vegetacione relativne vlažnosti vazduha, 1961/1990, 1991/2000 i 2001/2009

Table 7. Average month and vegetation relative air humidity (%) 1961/1990, 1991/2000 and 2001/2009

Period <i>Period</i>	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	IV – X
2001/2009	75	67	68	68	63	56	54	58	64	74	75	78	62
1991/2000	73	67	64	65	65	54	50	52	59	73	79	79	60
1961/1990	80	77	75	70	68	61	57	60	67	75	80	81	65

During examined period average year relative air humidity is between 65 till 71 % and vegetation 60 till 65%. It decreases for January to July and increases in December. Advantageous humidity is present during the faze of grape maturation.

Bioclimatic index is determined and temperature, sun glow, rains are connected with viticulture maturation. During the examined period a value of 12.0 is determined. This value gives the clue that Gevgelija area has excellent agro ecological condition for raising viticulture (Boskov S., 2000).

Conclusion

Gevgelija area is characterised with high temperature sum which contributes in grape maturation.

Year rain sum is relatively high but vegetation sum is low. Humid lack occurs in July till August and irrigation is needed.

Heliothermal and bioclimatic index show favourable heat and light conditions for viticulture rising.

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